



Final

Environmental Assessment for BRAC Facilities and Remote Field Training Site

Contract No. F41624-03-D-8595 • Task Order Q702

March 2008



Submitted to:



**Wright-Patterson
Air Force Base
88th Air Base Wing
Environmental
Management Division**

Prepared by:



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**FINDING OF NO SIGNIFICANT IMPACT/
FINDING OF NO PRACTICABLE ALTERNATIVE FOR
BRAC FACILITIES AND REMOTE FIELD TRAINING SITE,
WRIGHT-PATTERSON AFB, OHIO**

Pursuant to the Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (40 Code of Federal Regulations [CFR] 1500-1508), Department of Defense Directive 6050.1 and Air Force Regulation 32 CFR Part 989, the 88th Civil Engineer Directorate, Environmental Management Division has prepared an Environmental Assessment (EA) to identify and assess potential effects of the expansion of existing facilities, the construction of new facilities, and the construction of a remote field training site at Wright-Patterson Air Force Base (WPAFB), Ohio. This EA is incorporated by reference into this finding.

Purpose and Need

The 2005 Defense Base Realignment and Closure (BRAC) Commission mandates realigning several DoD missions with similar focus to WPAFB. Additional facilities are needed to support a number of missions that are being relocated to WPAFB. This EA evaluates the impacts of seven proposed actions: Expeditionary Medical Support (EMEDS) field training site, vivarium for research animals, entomology laboratory, waste storage facility, pipeline student dormitory for airmen attending specialized training at the Human Performance Wing (HPW), religious education center addition, and the relocation of the Air Force Research Laboratory/Sensors Directorate (AFRL/SN) functions from Rome Laboratories, New York, and Hanscom AFB, Massachusetts.

The construction of the HPW complex (and associated infrastructure upgrades) to house the majority of the inbound BRAC missions was addressed in a separate EA (Environmental Assessment for Construction of BRAC Infrastructure Upgrades and the Human Performance Wing Complex in the Area B Hilltop District).

Description of Proposed Actions

This EA evaluates the impacts of seven proposed actions. Six of the actions are proposed to support the relocation of the HPW missions to WPAFB: Expeditionary Medical Support (EMEDS) field training site, vivarium for research animals, entomology laboratory, waste storage facility, pipeline student dormitory for airmen attending specialized training at the HPW, and the religious education center addition. The last action evaluated in this EA is the relocation of the Air Force Research Laboratory/Sensors Directorate (AFRL/SN) functions from Rome Laboratories, New York, and Hanscom AFB, Massachusetts to WPAFB, Ohio.

The EMEDS mission will include erecting a decontamination/storage building for the Remote Field Training Site (RFTS), installing a gravel staging area immediately adjacent to the building, and providing minor electrical and water utility upgrades. This action will occur in the Prime Beef Training Area (PBTA) located in Area A of the base. The vivarium will require renovation and expansion of Facility 20838 in Area B to accommodate the increase in veterinary and vivarium services needed by the USAF School of Aerospace Medicine training and research missions. A new

entomology laboratory is proposed to be constructed in Area B to house and rear insects used in HPW insect vector research. A new waste storage facility will be constructed in Area B to contain non-hazardous waste, polychlorinated biphenyls, and universal wastes. The pipeline dormitory will be constructed in the Kittyhawk area. The religious education center action will include an addition to support additional meeting and multifunctional religious education to Facility 20229. The renovation and expansion of the AFRL/SN facility in Area B (Facility 20620) would accommodate the increase in laboratory space required to support the consolidation of the AFRL/SN missions from Hanscom AFB and Rome Laboratories with AFRL's existing directorate at WPAFB.

Description of the No-Action Alternative

Under the No Action Alternative, the seven proposed actions would not be implemented. Because this is a BRAC action and WPAFB will be the beddown location, the no action alternative serves as the baseline against which the proposed action is compared to.

Alternatives Considered but Eliminated from Consideration

Two alternate sites were considered for the RFTS which will accommodate the EMEDS mission. Both of these alternative sites are also located within the 100-year floodplain. One alternate site is located in Area C north of Hebble Creek Road, a short distance from the PBTA. This site is adjacent to the Huffman Prairie Flying Field, a National Historic Landmark with open access to the general public. As a result, this site does not meet the need for remoteness, and it also contains no existing utilities, parking areas, or other improvements needed for the RFTS that are already present at the PBTA. The second site considered for the RFTS is in the southwest corner of Area B adjacent to Lilly Creek. While this site is fenced and separated from the rest of WPAFB, it is adjacent to a four-lane roadway and off-base commercial and residential development. Therefore, it also does not meet the need for remoteness; it also has no existing improvements. These sites were eliminated from further evaluation because the installation of necessary improvements would require extensive disturbance of the sites, and the sites offer no measure of isolation or visual screening from the public. The necessary improvements and use of these sites would have comparable impacts to the floodplain as the Proposed Action.

Environmental Consequences

The Proposed Actions would have minimal or no environmental impacts on environmental justice (EA Section 4.14). The No Action Alternative for each of the seven actions, covered under this EA, would have no significant environmental impacts on any natural or manmade resources.

Natural Resources (EA Section 4.2): Under the Proposed Actions there would be short-term impacts to vegetation from site preparation and excavation activities. Impacts would be minor because the vegetation affected at each site is primarily maintained grass, which is common throughout the base and does not represent any unique or special vegetation species or communities. The area would be landscaped with similar vegetation species after the completion of construction activities. There would be minor short-term and long-term impacts to wildlife from habitat loss. Impacts would be minor because no unusual or high-quality habitat would be affected. Six of the seven sites have no recorded populations or habitat for threatened and endangered species.

Therefore, the Proposed Actions at these sites would have no effect on any protected species. The PBTA is considered to be potential habitat for the Indiana bat (federal endangered species) and the eastern massasauga rattlesnake (federal candidate species). Mitigation measures, as approved by the U.S. Fish and Wildlife Service (27 Dec 07, Appendix D), would be implemented to avoid impacts to these species. These measures would include training of contractors and other users of the site prior to activities, daily inspections during construction, limiting the proposed improvements and training activities to the existing disturbed area of the PBTA, and seasonal limitations on vegetation clearing and construction activities. Provided these guidelines are followed, the project, as proposed is not likely to adversely affect the eastern massasauga or the Indiana bat.

Water Resources (EA Section 4.3): Under the Proposed Actions there would be no direct impacts to any surface waters. Impacts to surface water quality from erosion during site preparation and excavation activities would be minimized by implementing erosion control and siltation controls. Six of the seven sites are not located within the 100-year floodplain. The proposed location of the RFTS, the PBTA, is located within the 100-year floodplain. The PBTA is the only existing training site at WPAFB and was selected for the RFTS because it is remote and secure, and already contains a utility infrastructure and other improvements. The proposed improvements to make the site ready for the RFTS are: installation of one small storage (uninhabited) structure, minor underground utilities upgrades, and gravel pads for tents and vehicles. Except for the storage building, these activities would have little or no effect on the ground elevation or storage capacity of the floodplain. Furthermore, most of the proposed surfaces in the PBTA would be pervious (gravel) surfaces, thereby retaining the ability of flood waters and precipitation to percolate into the soil. Approval has been received from the Miami Conservancy District (27 Nov 07, Appendix E).

The proposed action at the RFTS, Sensors Directorate Facility and pipeline dormitory will likely cover more than 1 acre, requiring a site-specific Storm Water Construction Permit. The proposed actions will require a Permit to Install, requiring the city of Dayton Waste Water Treatment Plant concurrence that will be submitted to the Ohio Environmental Protection Agency (EPA).

Installation Restoration Program (IRP) Sites (EA Section 4.4.3): The Proposed Actions for the RFTS and the waste storage facility would have minor short-term impacts to IRP sites. Site preparation activities such as grading and utility tie-ins at the RFTS will occur in Fire Training Area 1 (FTA1); similar activities at the waste storage facility site would occur in Earth Fill Disposal Zone 4 (EFDZ 4). Digging and soil disturbances are allowable in the IRP-impacted sites with approval from Base Civil Engineering and Environmental Management Division personnel. The remaining five actions covered by this EA would not affect IRP sites at WPAFB.

Land Use (EA Section 4.5): The Proposed Actions for the pipeline student dormitory and waste storage facility would result in nominal short-term and long-term impacts to land use. The land use designations for the proposed location of the dormitory and waste storage facility would be changed from "open space" to "housing unaccompanied" and "industrial," respectively. These changes in land use are consistent with land use plans outlined in the WPAFB General Plan. The remaining five actions covered by this EA would not affect land use designations.

Soil Resources (EA Section 4.6): Under the Proposed Actions there would be minor short-term impacts from soil erosion during site preparation and excavation activities. Impacts would be

minimized because erosion control and siltation controls would be implemented. Over the long term, there would be a minor loss of soil resources at permanent building and pavement sites.

Cultural and Historic Resources (EA Section 4.7): State Historic Preservation Office (SHPO) coordination has been completed, and five of the sites will have no impacts to significant historic properties. SHPO has concurred on this matter. Proposed actions at the following historic properties: entomology site, Sensors Directorate (Facility 20620), and Facilities 20012 and 20017 will have an affect on these historic properties. However, SHPO has conditionally concurred with WPAFB's finding that the BRAC activities covered by this EA will have no adverse effects on these facilities, in addition to any other of the base's historic properties. In accordance with SHPO's February 20, 2008, concurrence and stipulated conditions, prior to the start of any construction activities, WPAFB will submit to SHPO for review and approval the elevation drawings of the proposed entomology facility located within the Wright Field Historic District, and the plans and specifications for the rehabilitation of historic Facilities 20620 (including addition), 20012, and 20017.

Air Quality (EA Section 4.8): Under the Proposed Actions there would be minor short-term impacts to air quality. Impacts from construction activities include the generation of fugitive dust and particulates from the removal and grading of soil, excavation operations, and other associated construction activities. In addition, there would be minor, short-term emissions from vehicles that would travel in the construction area. During construction, dust suppression measures would be used to minimize fugitive dust emissions. WPAFB will coordinate with Ohio EPA to amend the Title V Permit to allow for increased emissions during construction activities.

Noise (EA Section 4.9): Under the Proposed Actions there would be minor impacts on ambient noise from site preparation, excavation, and construction activities. Impacts would be short term and minor because these activities would be carried out during normal working hours. There would be no long-term impacts to noise.

Health and Safety (EA Section 4.10): Under the Proposed Actions there would be potential minor impacts to workers during construction activities. Impacts would be minimized by adherence to safety standards.

Two sites contain IRP sites. FTA1 is located at the RFTS; an investigation of FTA1 concluded that the IRP site poses minimal risk to human health. The proposed location of the waste storage facility is within EFDZ 4; an investigation of EFDZ 4 concluded that there are no adverse health effects expected from exposures at this site. No digging restrictions are associated with either IRP site; however, soil-disturbing activities must be approved by Base Civil Engineering and Environmental Management Division personnel. No long-term impacts on health and safety are expected at either site.

The proposed entomology site is located on the western edge of the former Building 79A-D/95 complex "area of concern" (AOC). Contaminants have been detected in the groundwater in the vicinity of this AOC. Due to the site's proximity to the AOC, environmental sampling (for example, soil and groundwater) will be performed to determine the presence of potential contamination at the

site. Necessary site reclamation or design specifications (such as to prevent vapor intrusion) will be implemented.

Socioeconomic Resources (EA Section 4.11): Under the Proposed Actions there would be short-term and long-term beneficial impacts to the local economy resulting from construction related employment, temporary and permanent staff relocation to the area, and the purchase of goods and services.

Transportation/Traffic (EA Section 4.12): Under the Proposed Actions there would be short-term impacts from intermittent roadway closures in the project areas during construction. Construction of projects in Area B (Sensors Directorate Facility, vivarium, entomology site, and waste storage facility) may also result in short-term impacts to local traffic at Gate 19B from additional construction vehicles. Roadway improvements already programmed under a separate project will address the additional traffic in Area B from these projects, so no long-term impact to transportation is expected. No long-term impacts to transportation or traffic are expected at the RFTS, pipeline student dormitory, or the religious education facility.

Utilities (EA Section 4.13): Under the Proposed Actions short-term negative impacts may result due to intermittent outages at existing facilities during construction. Impacts to existing lines not targeted for replacement would be minimized by verifying their locations in advance and following standard operating procedures. No long-term impact to utilities service at any of the sites is expected.

Cumulative Impacts (EA Section 4.15): The cumulative effects of the Proposed Action when added to other current and reasonably foreseeable future actions were found to be insignificant. Projects planned in Area B during fiscal year (FY) 2008 through FY 2010, where several of the proposed actions will be located, include the infrastructure upgrades for the BRAC missions, the HPW facility, the Information Technology Center and the Materials Computation Research Facility, and additions to the Air Force Institute of Technology. Approximately two-thirds of these project areas are currently maintained grass areas and the rest is developed, such as existing roadways, building sites, or parking lots. Similarly, the pipeline student dormitory and Chapel Family Life Center addition would occur at sites that have previously been disturbed and are currently maintained lawns. Upon completion of construction, approximately 25 percent of the development areas would be returned to maintained open grass areas. The RFTS project will involve minor removal of woody vegetation, although most of the improvements at that site also will occur on open fields and gravel areas. Thus, there will be a cumulative loss of open space as a consequence of these developments; however, given their current condition, the cumulative impact to natural resources would not be significant.

The cumulative needs for increased utility support and roadway improvements for all of the proposed projects in Area B will be addressed by the BRAC infrastructure upgrade project. Projects in other areas of the base will have no effect on the available utilities or roadway infrastructure. Therefore, no cumulative impact to utilities or transportation is expected from these projects.

All of these projects would have a substantial positive, cumulative impact on the local and regional economies.

Public Notice

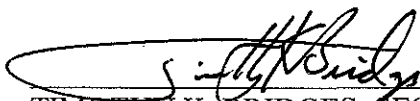
A public notice was posted in the *Dayton Daily News* on December 21, 2007. The comment period was held from December 21, 2007, until January 21, 2008. No comments were received.

Finding of No Significant Impact (FONSI)

The Proposed Actions are to construct new facilities or expand existing facilities at WPAFB to support the inbound BRAC missions. Under the No Action Alternative, no improvements would be made. Based upon my review of the facts and analysis contained in the EA, which is hereby incorporated by reference, I conclude that the Proposed Actions and the No Action Alternative will not have a significant impact on the natural or human environment. An environmental impact statement is not required for this action. This analysis fulfills the requirements of the NEPA, the President's Council on Environmental Quality regulations, and 32 CFR 989.

Finding of No Practicable Alternative (FONPA)

Taking the above information into consideration, pursuant to Executive Order (EO) 11988, *Floodplain Management*, and the authority delegated by Secretary of the Air Force Order 791.1, I find there is no practicable alternative to conducting the Proposed Action in the floodplain, and that the Proposed Action includes all practicable measures to minimize harm to the environment. This finding fulfills both the requirements of the referenced EO and the Air Force Environmental Impact Analysis Process (32 CFR 989.14) for a Finding of No Practicable Alternative.


TIMOTHY K. BRIDGES, SES
Director of Communications, Installations
and Mission Support

Date: 31 Mar 08

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List of Acronyms

| | |
|-----------|-------------------------------------------------------------------|
| AAFES | Army and Air Force Exchange Service |
| ACGIH | American Conference of Governmental Industrial Hygienists |
| ADT | average daily traffic |
| AF | Air Force |
| AFB | Air Force Base |
| AFI | Air Force Instruction |
| AFIOH | Air Force Institute of Operational Health |
| AFIOH/RSB | AFIOH Health and Safety Division |
| AFPD | Air Force Policy Directive |
| AFRIMS | Air Force Restoration Information Management System |
| AFRL | Air Force Research Laboratory |
| AFRL/HEP | Air Force Research Laboratory Biosciences and Protection Division |
| AFRL/SN | Air Force Research Laboratory Sensors Directorate |
| AICUZ | Air Installation Compatible Use Zone |
| ANSI | American National Standards Institute |
| AOC | area of concern |
| APE | area of potential effects |
| APZ | Accident Potential Zone |
| AST | aboveground storage tank |
| bgs | below ground surface |
| BHE | BHE Environmental, Inc. |
| BMP | Basewide Monitoring Program |
| BMT | Basic Military Training |
| BRAC | Base Realignment and Closure |
| BS | burial site |
| CAA | Clean Air Act |
| CAMS | Consolidated Aircraft Maintenance Squadron |
| CATEX | categorical exclusion |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| CO | carbon monoxide |
| COBRA | Cost of Base Realignment Actions |
| CRM | Cultural Resources Manager |
| CWA | Clean Water Act |

List of Acronyms (cont.)

| | |
|-----------------|---------------------------------------------------|
| CY | calendar year |
| DAHNHP | Dayton Aviation Heritage National Historical Park |
| dB | decibel |
| dBA | A-weighted decibel |
| DoD | United States Department of Defense |
| DOT | Department of Transportation |
| EA | environmental assessment |
| EFDZ | earthfill disposal zone |
| EIAP | Environmental Impact Analysis Process |
| EIS | Environmental Impact Statement |
| EMEDS | Expeditionary Medical Support |
| EO | Executive Order |
| ESA | Endangered Species Act of 1973 |
| FONPA | Finding of No Practicable Alternative |
| FONSI | Finding of No Significant Impact |
| FPCON | Force Protection Condition |
| FR | Federal Register |
| ft ² | square feet |
| FTA | Fire Training Area |
| FY | fiscal year |
| GLARC | Great Lakes Archaeological Research Center, Inc. |
| GLTS | Gravel Lake Tanks Site |
| gpd | gallon per day |
| gpm | gallon per minute |
| gsf | gross square feet |
| HAZMAT | hazardous material |
| HE | Human Effectiveness |
| HPFF | Huffman Prairie Flying Field |
| HPW | Human Performance Wing |
| HSG | Human Systems Group |
| HW | hazardous waste |
| I-675 | Interstate 675 |
| ICI | International Consultants Incorporated |
| ICRMP | Integrated Cultural Resources Management Plan |
| INRMP | Integrated Natural Resources Management Plan |

List of Acronyms (cont.)

| | |
|-------------------|-------------------------------------------------------|
| IRP | Installation Restoration Program |
| ITC | Information Technology Center |
| kV | kilovolt |
| kVA | kilovolt amperes |
| KZF/BWSC | KZF Design and Barge, Waggoner, Sumner and Cannon |
| lb/hr | pounds per hour |
| LOS | level of service |
| mgd | million gallons per day |
| MOA | Memorandum of Agreement |
| MSA | metropolitan statistical area |
| msl | mean sea level |
| NAAQS | National Ambient Air Quality Standards |
| NAMRL | Naval Aerospace Medical Research Laboratory |
| NEPA | National Environmental Policy Act |
| NIOSH | National Institute for Occupational Safety and Health |
| NOI | Notice of Intent |
| NO _x | nitrogen oxides |
| NPDES | National Pollutant Discharge Elimination System |
| NPS | National Park Service |
| NRHP | National Register of Historic Places |
| NSF | net square feet |
| OAC | Ohio Administrative Code |
| ODNR | Ohio Department of Natural Resources |
| Ohio EPA | Ohio Environmental Protection Agency |
| ORAM | Ohio EPA's Rapid Assessment Method |
| ORC | Ohio Revised Code |
| OSHA | Occupational Safety and Health Administration |
| OU | operable unit |
| PCB | polychlorinated biphenyl |
| PBTA | Prime BEEF Training Area |
| PM | particulate matter |
| PM _{2.5} | particulate matter less than 2.5 microns in diameter |
| POL | petroleum, oil, and lubricant |
| PTI | permit to install |
| Q/D zone | explosive safety zone |

List of Acronyms (cont.)

| | |
|-----------------|-----------------------------------------------------------------|
| RCRA | Resource Conservation and Recovery Act |
| RFTS | remote field training site |
| RI | remedial investigation |
| SAIC | Science Applications International Corporation |
| SCS | Soil Conservation Service |
| SHPO | State Historic Preservation Office |
| SIP | State Implementation Plan |
| SO ₂ | sulfur dioxide |
| SPCC | Spill Prevention Control and Countermeasure |
| SR | State Route |
| SWMP | Storm Water Management Plan |
| SWP3 | Storm Water Pollution Prevention Plan |
| TCE | trichloroethylene |
| TIP | Transportation Improvement Program |
| tpy | tons per year |
| TSCA | Toxic Substances Control Act |
| TSD | treatment, storage, and disposal |
| USACE | United States Army Corps of Engineers |
| USACERL | United States Army Construction Engineering Research Laboratory |
| USAF | United States Air Force |
| USAFSAM | United States Air Force School of Aerospace Medicine |
| USC | United States Code |
| USDA | United States Department of Agriculture |
| USEPA | United States Environmental Protection Agency |
| USFWS | United States Fish and Wildlife Service |
| UST | underground storage tank |
| UTC | Unit Type Code |
| VOC | volatile organic compound |
| WPAFB | Wright-Patterson Air Force Base |
| WRM | war reserve material |
| WWTP | wastewater treatment plant |

1 Purpose and Need for Action

1.1 Introduction

The U.S. Department of Defense (DoD) is reorganizing its base structure to more efficiently and effectively support U.S. forces, increase operational readiness, and facilitate new ways of doing business, in accordance with the Defense Base Closure and Realignment Act of 1990 (BRAC). The purpose of BRAC is to realign military assets with the current threats and to eliminate excess capacity and reduce costs by sharing facilities to a greater extent. Excess capacity is defined as underused or unused facilities and/or infrastructure. Current BRAC efforts placed greater emphasis on joining organizations from different services that have a similar focus. Joining appropriate organizations from two or more services to share facilities in the right location can significantly improve organizational effectiveness while reducing costs.

1.2 Background

The 2005 BRAC Commission mandates realigning several DoD missions with similar focus to Wright-Patterson Air Force Base (WPAFB), Ohio (Figure 1). Actions were identified in the 2005 BRAC Final Report which will result in realignment of seven military organizations to WPAFB:

1. U.S. Air Force School of Aerospace Medicine (USAFSAM) Training, Education, and Consultation missions presently located at Brooks City Base, Texas
2. Air Force Institute of Operational Health (AFIOH) Campus presently located at Brooks City Base, Texas
3. Air Force Research Laboratory (AFRL) Human Effectiveness (HE) Directorate Warfighter Readiness, Biosciences, and Aerospace Medical Research missions, presently located at WPAFB; Brooks City Base, Texas; and Mesa, Arizona
4. Naval Aerospace Medical Research Laboratory (NAMRL) presently located at Pensacola Naval Air Station, Florida
5. Sensors Directorate (AFRL/SN) presently located at Rome Laboratories, New York, and Hanscom Air Force Base (AFB), Massachusetts
6. Human Systems Group (HSG) Development and Acquisition offices and laboratories, presently located at Brooks City Base, Texas

7. Fixed Wing Development and Acquisition Missions, presently located at Hill AFB, Utah; Tinker AFB, Oklahoma; and Robins AFB, Georgia

The first four of these missions will be collocated into a new Human Performance Wing (HPW) complex in the Area B Hilltop District. This complex will comprise two new facilities totaling approximately 700,000 gross square feet (gsf), located north and south of 5th Street just west of Q Street. Environmental impacts associated with the new HPW complex, and several utility and roadway infrastructure upgrades to accommodate the BRAC and other programmed facilities in the Hilltop District, were recently evaluated and documented in the *Final Environmental Assessment for Construction of BRAC Infrastructure Upgrades and the Human Performance Wing Complex in the Area B Hilltop District* (CH2M HILL, 2007).

Several other facilities also are proposed to support the relocation of the HPW missions to WPAFB, which would not be located within the HPW complex. This Environmental Assessment (EA) was developed to assess and present the potential environmental consequences associated with these actions, as follows:

- Expeditionary Medical Support (EMEDS) remote field training site
- Vivarium for research animals
- Entomology laboratory
- Waste storage facility
- Pipeline student dormitory, for airmen attending specialized training at the HPW
- Religious education center addition

This EA also evaluates the fifth BRAC mission, that is, relocation of the AFRL/SN missions from Rome Laboratories, New York, and Hanscom AFB, Massachusetts to WPAFB. These missions are proposed to be located in an addition to Facility 20620, where the existing AFRL/SN research laboratory at WPAFB is located.

Several of the BRAC missions have elements that will be located in renovated, existing facilities at WPAFB and that are not evaluated in this EA.

- Building 30002 (Area C) is proposed for renovation for relocating approximately 1,900 net square feet (NSF) of AFIOH storage space from Brooks City Base, San Antonio, Texas. Building 30002 is presently used to store medical war reserve materials (WRMs), and collocating the BRAC AFIOH WRM storage requirement together will result in operational efficiencies. This building is a contributing building to Fairfield Air Depot Historic District. The renovation needed for this structure will include temperature controls and would all be internal, not affecting the exterior architecture. The final design will be coordinated with the WPAFB Cultural Resources Manager (CRM) in 88 ABW/CEV, and with the Ohio State Historic Preservation Office (SHPO) in accordance with Section 106 of the National Historic Preservation Act, if necessary, to ensure that there will be no adverse effects.
- Building 20033 (Area B) is proposed for renovation for relocating approximately 2,127 NSF of laboratory space from the AFRL Mesa Research Site, Mesa, Arizona. Building 20033 is presently AFRL laboratory space and moving similar BRAC AFRL Mesa laboratory space there will create additional operational efficiencies. This is a historic building individually eligible for listing on the National Register of Historic Places (NRHP). The renovation proposed for this structure is all internal, not affecting the exterior architecture. The final design will be coordinated with the WPAFB CRM in 88 ABW/CEV, and with the SHPO, if necessary.
- The last two BRAC missions, the HSG and Fixed Wing Development and Acquisition missions, will also be located in two existing facilities, Facilities 20012 and 20017, in Area B. The Headquarters Human Systems Wing/YA function and the Fixed Wing Development and Acquisition functions will be relocated to Facility 20012. The HSG laboratory functions will be separately located in Facility 20017. Both of these historic facilities require major interior renovations/alterations to upgrade to the latest facility codes and standards. Additionally, Facility 20017 requires a major exterior alteration/renovation (roof replacement) to meet mission requirements. Facilities 20012 and 20017 are contributing buildings to the Wright Field Historic District. Furthermore, Facility 20012 is individually eligible for the NRHP. The proposed renovations/alterations to Facilities 20012 and 20017 have been coordinated with the SHPO in accordance with Section 106 of the National

Historic Preservation Act, to ensure that there will be no adverse effects on these historic facilities (see correspondence of November 30, 2007 and February 20, 2008, in Appendix F). The SHPO has concurred with the finding of no adverse effect on Facilities 20012 and 20017 provided WPAFB adheres to stipulated conditions for these facilities. These conditions are outlined in the February 20, 2008, SHPO letter in Appendix F and in Section 4.7 of this EA.

In accordance with Title 32, Code of Federal Regulations, Part 989 (32 CFR Part 989), all of these building renovations fall within a class of actions that do not individually or cumulatively have potential for significant effect on the environment, and therefore are considered categorical exclusions (CATEX) under the National Environmental Policy Act (NEPA) of 1969. Specifically, these actions are consistent with the CATEX action described in 32 CFR 989, Appendix B, A2.3.8, “Interior and exterior construction within the 5-foot line of a building without changing the land use of the existing building.” Therefore, these actions have been documented in separate CATEX documents, attached to this EA as Appendix B. Since Facilities 20012 and 20017 are historic, the historic and cultural resource impacts from the proposed renovations/alterations are assessed in this EA.

The cumulative environmental impacts of the entire BRAC construction program at WPAFB are assessed to be insignificant.

This EA has been performed in accordance with NEPA; 40 CFR 1500; the Council on Environmental Quality (CEQ) regulations implementing NEPA; and the U.S. Air Force (USAF) Environmental Impact Analysis Process (EIAP; (32 CFR Part 989).

1.3 Purpose and Need for the Proposed Action

The 2005 Defense BRAC Commission forwarded a Final Report on September 8, 2005, completing its review of initial BRAC recommendations made by the Secretary of Defense and provided its list of recommended base closures to the President. The President accepted the Commission’s recommendations and forwarded them to Congress. Since Congress did not disapprove the recommendations within the time period provided under law, the recommendations are required by law to be implemented; therefore, those 2005 BRAC recommendations associated with WPAFB must be implemented as stated in the Final Report without any deviation or consideration of

alternate locations. As such, WPAFB is the only installation under consideration for the actions described in this EA. Now USAF, along with the other military services, is required to execute the 2005 BRAC decisions and conduct the environmental analysis of the Proposed Actions. Several actions needed to support the realignment of military organizations to WPAFB are being evaluated in this EA. This EA identifies and evaluates the environmental impacts of these actions. As discussed in Section 1.3, an EA was completed in September 2007 which addressed other Proposed Actions required to execute the 2005 BRAC decisions (CH2M HILL, 2007).

1.4 Project Descriptions

1.4.1 Human Performance Wing Support Facilities

The following actions are needed to support the relocation of the HPW missions to WPAFB.

1.4.1.1 EMEDS Remote Field Training Site Infrastructure

This action prepares a remote field training site (RFTS) for EMEDS training. The EMEDS course is formal training required by all Air Force Medical Service personnel assigned to the EMEDS Unit Type Code (UTC). EMEDS are comprised of rapidly deployable medical teams that can range from large tented facilities with specialized services to five-person teams carrying backpacks. These five-person mobile field surgical teams travel with 70-pound backpacks that hold enough medical equipment to perform 10 life-saving surgeries anywhere, at anytime, and under any conditions.

The EMEDS training course is conducted in a field setting. Students of this course are briefed on the EMEDS concept of operations, build the EMEDS tent system, review their core competencies and medical specialties, and participate in a 2-day field exercise. Currently, EMEDS hold twenty 5-day courses per year, but will be increasing to 26 courses per year to accommodate training requirements.

A remote site needs to be prepared to accommodate multiple expeditionary type (that is, temporary) structures, support/storage facilities, and specialized equipment; it also must be isolated physically and visually from other adjacent base or community operations. WPAFB cannot meet these specialized requirements with its existing facilities space and training inventory.

1.4.1.2 *Construct the Vivarium*

The AFRL's Biosciences and Protection Division (AFRL/HEP), currently located at Brooks City Base, conducts research and development on fatigue countermeasures, aircrew protection, impact protection, and escape technologies to improve and sustain performance, protection, and survivability in the aerospace environment. Training courses (such as EMEDS) and robust operational support and wound healing research program require veterinary/animal model support services. Both large animals (such as swine) and small animals (rodents and rabbits) must be accommodated. Additional facilities are needed near the new HPW complex, including high tech laboratory space, administrative space, a Vivarium for animal handling care and support, and small surgical theater. No facilities presently exist at WPAFB to support these mission requirements to comply with BRAC 2005.

1.4.1.3 *Construct an Entomology Laboratory*

The Health and Safety Division (AFRL/HEP), Brooks City Base, performs operational health risk assessments to identify exposure risk factors, including insect vector research. The entomology laboratory building would function as an insect rearing and containment facility to support research and training. While these insects are neither infectious nor invasive in any manner, a facility isolated from the main HPW campus is needed primarily to keep any insects that might escape containment from entering the research laboratories. A facility comparable to the one at Brooks City Base is needed for seamless relocation to WPAFB.

1.4.1.4 *Construct a Waste Storage Facility*

The future HPW complex would consist largely of research laboratories which will use various hazardous materials (HAZMAT). The exact quantities of HAZMAT to be purchased, used, and stored in the HPW complex is not known at this time; however, based on historical waste generation activities of the incoming organizations, an estimate was made of the future Area B HAZMAT purchase, usage, and storage needs and compared to the existing temporary storage capacity.

An existing Resource Conservation and Recovery Act (RCRA)-permitted treatment, storage, and disposal (TSD) facility (Facility 20479) is located in Area B. This facility is used to store RCRA, non-RCRA, and Toxic Substances Control Act (TSCA) waste from Area B only. From this facility,

waste is properly prepared per U.S. Environmental Protection Agency (USEPA) and Department of Transportation (DOT) regulations for offsite shipment and final disposal.

A comparison of annual waste generation data (in gallons) of the future HPW complex (calendar year [CY] 2004) and existing Area B organizations (an average from CY 2004 to CY 2006) was made to assess the impact of the projected future waste volumes on the current storage capacity at Facility 20479. Data analyzed included RCRA (hazardous) and non-RCRA (nonhazardous) waste from the future HPW complex and RCRA (hazardous), non-RCRA (nonhazardous), and TSCA (toxic) waste from existing Area B organizations. The following HPW wastes were eliminated from analysis, because:

- TSCA wastes – These consist primarily of asbestos and light fixture ballasts containing polychlorinated biphenyls (PCBs) and were eliminated because they originate from obsolete infrastructure technologies. Future HPW facilities should generate little, if any, of these wastes.
- Universal waste (lamps) – this type of waste was eliminated because it would not be stored in Facility 20479.

The existing facility is a 50-foot by 85-foot (4,250 square foot [ft²]) metal structure on concrete specifically designed to store RCRA hazardous waste. The interior is divided into three bays in order to store different types of waste: flammables, corrosives, and toxics (to include oxidizers and acutely hazardous waste). The flammables bay covers approximately one-half the space, and the remaining space is divided evenly for corrosives and toxics. Bays are physically separated by cinder block half-walls. The flammables bay is also used to store non-RCRA waste and does contain a storage cabinet (30 inches by 57 inches) for isolating water-reactive wastes. The toxics bay is used to store TSCA waste (nonhazardous) waste.

The wastes were divided into the types that would be properly stored in each bay.

| Storage Bay | Waste Type | Area B Waste (gallons) | Projected HPW Waste (gallons) | Projected Waste Volumes | |
|-------------|------------|---------------------------|-------------------------------------|---------------------------------|---------------------|
| | | | | Total Waste Volume (gallons) | Percent Increase |

| | | | | | |
|-----------|-------------------|--------|--------|--------|------|
| Flammable | Flammables | 3,813 | 2,575 | 18,099 | 79% |
| | Non-RCRA | 6,317 | 5,394 | | |
| Cabinet | Water-reactive | 27 | 112 | 139 | 415% |
| Corrosive | Corrosives | 461 | 802 | 1,263 | 174% |
| Toxic | Toxics | 1,709 | 2,105 | 6,298 | 51% |
| | TSCA | 2,349 | 0 | | |
| | Oxidizers | 65 | 14 | | |
| | Acutely hazardous | 52 | 4 | | |
| Total | | 14,792 | 10,992 | 25,799 | 74% |

Overall, the analysis determined that the volume of Area B waste will increase by 74 percent. The largest percentage increases occur in the water-reactive cabinet and the corrosives bay, but the volume increases are small enough not to require extra space. However, the flammable and toxic bays will not be able to accommodate both the significant percentage increases and total volumes to be expected.

Facility 20479 cannot accommodate the total projected waste generated by the future HPW complex. However, the facility could accommodate all of the projected RCRA waste if additional storage space in Area B is provided for all projected non-RCRA and TSCA waste. To provide the additional waste storage space needed in Area B, this project would construct a separate storage facility for all non-RCRA and PCB wastes generated in Area B. This action would free up space in Facility 20479 to store the additional RCRA wastes generated from the new missions.

1.4.1.5 Construct a New Pipeline Student Dormitory

The term “pipeline student” is used to refer to students who are training at the USAFSAM, which will be a part of the HPW. In order to meet requirements of the BRAC 2005 actions, a dormitory meeting Air Force design standards is needed to house the USAFSAM students.. A major Air Force objective provides unaccompanied enlisted personnel with housing conducive to their proper rest, relaxation, and personal well-being. Properly designed and furnished quarters providing some degree of individual privacy are essential to the successful accomplishment of the increasingly complex and

important jobs these people perform. Retaining these highly trained airmen is essential to USAF readiness posture and continuing its worldwide presence.

WPAFB has insufficient on-base housing to accommodate the unaccompanied enlisted technical training students. These USAFSAM pipeline students require a dedicated dormitory.

The pipeline students are recent graduates of Basic Military Training (BMT). As part of their continued training, the BMT atmosphere of strict discipline and control is maintained. The pipeline student housing would be designed to segregate the students and provide this controlled atmosphere. The pipeline student dormitory must be a standalone structure with strict controls on entry and exit. The student modules are based on a standard of 96 ft² of living space, with not more than two persons per sleeping/living room or bath. Existing WPAFB airmen dormitories are designed for permanent airmen and cannot accommodate the unique housing requirements for the USAFSAM pipeline students. In these standard quarters, a private combination sleeping/living area of 129 ft² is allowed, with attached shared areas such as a kitchen, social space, laundry and utility space. This more open design is contradictory to the training atmosphere.

1.4.2 *Expand Facility 20620 (Sensors Directorate)*

Additional laboratory space is required to consolidate the AFRL/SN from both Hanscom AFB and Rome Laboratories with AFRL's existing Sensors Directorate functions at WPAFB. AFRL/SN functions require approximately 130,000 gsf of specialized secure laboratory and support space, ideally located in or near Facility 20620, where the Sensors Directorate is currently located. The existing facility has an adequate amount of space to meet about 30 percent of the space requirement, but it must be renovated and reconfigured to support the new function. Additional laboratory space is needed to accommodate the balance of the space requirement. Collocation and consolidation of these missions with the AFRL's existing directorate at Facility 20620 would provide greater synergy across technical disciplines and functions, and position the DoD to exploit a center-of-mass of scientific, technical, and acquisition expertise. It would integrate avionics with shared aperture sensor concepts and integrated offensive/defensive functions currently not housed at the same location. The project also will provide secure interactive modeling and simulation laboratories and allow for integrated aircraft and weapons system level evaluations.

1.4.3 *Religious Education Center*

Relocating the HPW and Sensors Directorate missions to WPAFB will include approximately 1,800 new staff and their families. In addition to increased manpower strength due to BRAC, current world events have increased operations tempo, taxing military families and creating a greater need for those functions. The purpose of this action is to provide an adequately sized (2,070 gsf) multi-faith religious education facility to support the increasing need.

The existing base chapels lack religious education and activity space required for families attending religious services. WPAFB currently only has one space dedicated for religious education in Facility 30206. Constructed in 1941, Facility 30206 is located in Area C on the flight line and is a combination of administrative and aircraft hangar space; it houses base operations and the airfield control tower. As such, this space is not conducive for religious education. While the religious education facility can be used by other components on an “as available” basis, in accordance with Air Force requirements, the facility must be available for chapel use 7 days a week. Operations during alert situations require the facility to be secured, canceling any religious education training activity. Due to the lack of appropriate facilities, attendance is hindered, negatively impacting the spiritual health of the installation’s military population.

1.5 *Decision to be Made*

The purpose of this EA is to analyze the environmental impacts of the Proposed Action and its alternatives (including the No Action Alternative). Based on the evaluation in this EA, a determination would be made as to whether there are significant environmental impacts expected from the Proposed Action. The evaluation in this EA would result in a Finding of No Significant Impact and of No Practicable Alternative (FONSI/FONPA) if environmental impacts are not significant or in the determination that an Environmental Impact Statement (EIS) must be prepared if environmental impacts are significant. This EA provides the decision maker and the public with information required to understand the short-term and long-term consequences of the Proposed Action and its alternatives.

1.6 Scope of Environmental Analysis

The Proposed Action and alternatives are evaluated for potential environmental impacts to these elements of the natural and human environment:

- Natural resources
- Water resources
- Land use
- HAZMAT/hazardous waste (HW), stored fuels, and Installation Restoration Program (IRP)
- Soil
- Cultural resources
- Air quality
- Noise
- Health and safety
- Socioeconomics
- Transportation/traffic
- Utilities
- Environmental justice

1.7 Regulatory Requirements

Statutes and regulations to which USAF must comply are summarized in Table 1. The regulatory requirements are listed under each appropriate category in Section 3.

TABLE 1
Summary of Applicable Environmental Compliance Requirements for the Proposed Action and Alternatives

| Potential Environmental Impacts | Applicable Statutes and Regulations |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Natural Resources | <ul style="list-style-type: none"> • AFI 32-7064, Integrated Natural Resource Management • Endangered Species Act of 1973, 16 USC §1531 et seq. • 50 CFR Part 200 Wildlife and Fisheries • 50 CFR Part 402 Endangered Species Act of 1973 • 33 CFR Parts 320-330 Discharges of dredge and fill material into waters of the U.S. • Executive Order 11988 – Floodplain Management • Executive Order 11990—Protection of Wetlands • 40 CFR, Part 6, Appendix A—Protection of Floodplains • 40 CFR, Part 6, Appendix A—Protection of Wetlands • 40 CFR, Part 230—Protection of Wetlands • 40 CFR, Parts 320-330—Protection of Wetlands • CWA, Section 404 • ORC 1531.25, Protection of Species Threatened with Statewide Extinction |
| Land Use | <ul style="list-style-type: none"> • AFI 32-7063, AICUZ Program |
| Cultural/Historic Resources | <ul style="list-style-type: none"> • AFI 32-7065, Cultural Resources Management • National Historic Preservation Act of 1966, as amended • 36 CFR Part 800—Protection of Historic and Cultural Properties |
| Air Quality | <ul style="list-style-type: none"> • NAAQS—40 CFR §81.34 and §81.336 • OAC 3745-17 Particulate Matter Standards • OAC 3745-31 PTI New Source of Pollution • OAC 3745-25 Emergency Episode Standards • OAC 3745-15-06 De minimis air contaminant source exemption |
| Noise | <ul style="list-style-type: none"> • 29 CFR 1910.95 Occupational Noise Exposure |
| Wastewater/Storm Water | <ul style="list-style-type: none"> • 40 CFR Part 122.26 Storm Water Discharges • OAC 3745-31 Permit to Install New Source of Pollution • OAC 3745-33 Ohio NPDES Permit • OAC 3745-38 NOI • Air Force Technical Order 42C-1-2 (dated 1 October 2003) • City of Fairborn Sewer Use Ordinance • City of Dayton Sewer Use Ordinance (September 21, 1994) |

AFI = Air Force Instruction
AICUZ = Air Installation Compatible Use Zone
CWA = Clean Water Act
NAAQS = National Ambient Air Quality Standards
NOI = Notice of Intent
NPDES = National Pollutant Discharge Elimination System
OAC = Ohio Administrative Code
ORC = Ohio Revised Code
OSHA = Occupational Safety and Health Act
PTI = Permit to Install
USC = United States Code

The Proposed Actions would require permits and/or coordination from various regulatory agencies.

The required permits are discussed in detail in Sections 3 and 4 and are summarized in Table 2.

TABLE 2
Summary of Applicable Permits for Proposed Action and Alternative

| Potential Environmental Impacts | Applicable Permits/Coordination | Agency |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Air Quality | <ul style="list-style-type: none"> • OAC 3745-31 PTI New Source of Pollution | <ul style="list-style-type: none"> • Ohio EPA |
| Storm Water | <ul style="list-style-type: none"> • OAC 3745-33/38 NOI and Subsequent Ohio NPDES Storm Water Construction Permit | <ul style="list-style-type: none"> • Ohio EPA |
| Wastewater | <ul style="list-style-type: none"> • OAC 3745-31 PTI New Source of Pollution • Coordination for new sources of wastewater discharge to Dayton WWTP | <ul style="list-style-type: none"> • Ohio EPA • City of Dayton |

NOI = Notice of Intent
NPDES = National Pollutant Discharge Elimination System
OAC = Ohio Administrative Code
PTI = Permit to Install
WWTP = Wastewater Treatment Plant

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2 Description of Proposed Actions and Alternatives

This section describes the Proposed Action alternatives, the No Action alternatives, and alternatives to the Proposed Actions. There are seven Proposed Actions being evaluated in this EA. Each of the Proposed Actions is required to support the relocation of inbound BRAC missions to WPAFB. Other options, later eliminated, were considered for several of the actions and are discussed at the end of the section.

2.1 Remote Field Training Site

2.1.1 Alternative 1—Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

The proposed location of the RFTS is the Prime BEEF Training Area (PBTA) located in Area C of WPAFB (Figures 3 and 4). The PBTA is the only existing training site at WPAFB and was selected for the RFTS because it is remote and secure, and already contains a utility infrastructure and other improvements that can meet some of the needs of the RFTS. The Air Force Reserves (445th Airlift Wing) uses the PBTA for base engineering emergency force training. In recent years, the need for training at the PBTA by the Air Force Reserves has been reduced, leaving the area available for EMEDS training.

Requirements for the RTFS include staging pads for tents, communication, electrical, water, and sewage capabilities. The site must be fenced and secure. Existing improvements at the PBTA already provide some of these infrastructure needs. The only permanent structure to be placed at the site is a heated, 600 ft² decontamination storage building. A 650 ft² gravel area would be located immediately adjacent to this structure to be used for staging. A water bladder would be used in warm weather and stored empty in the storage building during cold weather. At least 12 storage lockers would be located within the building. In addition to the decontamination storage building, there would be staging areas for latrine tents, EMEDS tents, long tents, regular tents, and designated training areas.

This project will also incorporate several utility line upgrades at the PBTA. Existing non-potable water lines will be replaced. Also, a new 220-volt service will be added to support the Consolidated

Aircraft Maintenance Squadron (CAMS) tent proposed at the southern end of the existing mock runway. Neither of these upgrades require any infrastructure upgrades outside the existing developed area of the PBTA. Finally, a new wastewater sewer connection will be installed from the PBTA to the wastewater collection system. No connection currently exists. A new line will be installed from the PBTA south along an existing gravel lane to a wastewater sewer main near State Route (SR) 444; the new line will tie in at an existing manhole near the lane.

In October 1998, an EA (referenced to herein as the PBTA EA) was prepared to address the cumulative impacts of training exercises at the PBTA (PES/Metcalf & Eddy, 1998). The FONSI for the PBTA EA was signed on March 22, 1999. This EA restricts training activities at PBTA to approximately 20 acres of disturbed areas, encompassing the existing compound and mock runway areas with the Air Force (AF) Form 813 restrictions being implemented. This commitment allows military training exercises to continue while minimizing adverse impacts to aquatic, terrestrial, and wetland habitats, as well as to archaeological sites. In accordance with this commitment, any EMEDS or other training associated with the inbound missions being conducted in the PBTA would be restricted to disturbed area.

2.1.2 *Alternative 2—No Action*

Under the No Action Alternative, it is assumed that the Proposed Action would not be completed. This alternative will serve as a baseline against which the Proposed Action can be compared. Under the No Action Alternative, USAF would maintain the environmental status quo, but would not comply with the 2005 BRAC decisions to realign or close bases. Increased synergies/efficiencies due to consolidations and collocations would not be realized.

2.2 *Sensors Directorate Facility*

2.2.1 *Alternative 1—Add/Alter Facility 20620 (Proposed Action)*

To accommodate the increase in laboratory space required to support the consolidation of sensors directorates from both Hanscom AFB and Rome Laboratories with AFRL's existing directorate at WPAFB, approximately 54,000 ft² of space within the existing sensors directorate facility (Facility 20620) at WPAFB would be renovated and an addition of approximately 93,000 ft² would be constructed at Facility 20620 (Figure 5). The addition to Facility 20620 would be a stand-alone,

multistory (possibly three floors) facility, including foundations, perimeter walls, floor slabs of poured reinforced concrete, roof system, utilities, and other necessary support. The addition, which would be located on the north-northeast side of Facility 20620, would be connected to Facility 20620 by covered or enclosed walkways. Although the parking lot design has not been finalized and approved, the current plan would include expanding the parking lot on Q Street across Avionics Circle and/or expanding the parking lot south of the campus, as needed.

Associated with the construction at Facility 20620 is the tie-in to infrastructure systems in the area such as water distribution and storm water. The Sensors Directorate area has adequate utility main lines. Potable water, sanitary sewer, and gas service laterals would be added as part of the construction of the addition (KZF/BWSC, 2007). In the case of the storm water system, some existing piping may need to be removed and/or rerouted as part of the proposed building addition depending on its final location. For instance, an existing 18-inch pipe may need to be rerouted to go around the south end of proposed building addition. Existing piping may need to be reworked at west end of north parking lot plus new piping may be required for additional parking lots. An existing 24-inch pipe for the south parking lot addition may require augmentation (KZF/BWSC, 2007).

2.2.2 *Alternative 2—No Action*

Under the No Action Alternative, it is assumed that the Proposed Action would not be completed. This alternative will serve as a baseline against which the Proposed Action can be compared. Under the No Action Alternative, USAF would maintain the environmental status quo, but would not comply with the 2005 BRAC decisions to realign or close bases. Increased synergies/efficiencies due to consolidations and collocations would not be realized.

2.3 *Vivarium*

2.3.1 *Alternative 1—Locate Vivarium Partly in the HPW Complex and an Expansion of Facility 20838 (Proposed Action)*

To accommodate the increase in Vivarium and veterinary/Vivarium services needed by the USAFSAM training and research missions requiring animal model support, a portion of the Vivarium (approximately 2,000 ft²) would be located in the future HPW complex (the south facility)

and the remainder of the Vivarium would be located at the existing AFRL Vivarium (Facility 20838) (Figure 6). Space within Facility 20838 would be renovated and an approximately 7,000 ft² addition would be constructed at the facility. The addition would contain new Vivarium and laboratory/procedure spaces.

The building addition would be adjacent to the southeast corner of Facility 20838. Grading around the Vivarium addition would be minimal. The Vivarium addition would use the existing storm sewer system already in place at the project area. Any sanitary sewer and gas requirements for the Vivarium addition would be connected to the existing system at Facility 20838. Any water service requirements for the Vivarium addition would be connected to the existing system that goes around the east side of Facility 20838. The Vivarium addition would get its heat supply from Facility 20838. Any utilities in the way of construction would be moved to accommodate the location of the addition.

This EA evaluates only the impact of construction at Facility 20838, as the impacts of the HPW facility have been evaluated in the previous EA (CH2M HILL, 2007).

2.3.2 *Alternative 2—No Action*

Under the No Action Alternative, it is assumed that the Proposed Action would not be completed. This alternative will serve as a baseline against which the Proposed Action can be compared. Under the No Action Alternative, USAF would maintain the environmental status quo, but would not comply with the 2005 BRAC decisions to realign or close bases. Increased synergies/efficiencies due to consolidations and collocations would not be realized.

2.4 *Entomology Site*

2.4.1 *Alternative 1—Construct an Entomology Site in Area B (Proposed Action)*

Insects are used in HPW insect vector research; therefore, a facility to house and rear insects is required to support this function. To support HPW insect vector research, construction of an entomology site is proposed; the location of the proposed entomology site is on the westernmost portion of 12th Street in Area B (Figures 7 and 8). The site is located on the western edge of the former Building 79A-D/95 complex. This laboratory would be an industrial type, approximately 1,500 ft² single-story building. As part of the building design, a vapor barrier would be installed

below the concrete slab floor. A six-space parking lot would be constructed west of the facility. Service feeds for the new facility would be supplied from existing utility services in the area (steam, water, electrical, sanitary, and communications).

The facility would be isolated from the future HPW complex to prevent any insects that may escape from entering the HPW research laboratories. The insects used in the HPW insect vector research are not infectious or invasive.

2.4.2 *Alternative 2—No Action*

Under the No Action Alternative, it is assumed that the Proposed Action would not be completed. This alternative will serve as a baseline against which the Proposed Action can be compared. Under the No Action Alternative, USAF would maintain the environmental status quo, but would not comply with the 2005 BRAC decisions to realign or close bases. Increased synergies/efficiencies due to consolidations and collocations would not be realized.

2.5 *Waste Storage Facility*

2.5.1 *Alternative 1—Construct New Waste Storage Facility in Area B (Proposed Action)*

The existing waste storage facility (Facility 20479) cannot accommodate the 74 percent increase in waste expected for Area B, including that generated by the proposed BRAC missions, without jeopardizing storage limits. Therefore, an additional 1,600 ft² waste storage facility has been proposed to be constructed north, and just outside the fence, of Facility 20479, designed to store non-RCRA and TSCA wastes (Figure 9). The new facility would be an industrial type, single-story building with only heat, secondary containment, and an emergency eyewash/shower. (Note: PCB wastes will not be generated in conjunction with the new HPW complex.) This facility would not need to meet the requirements for a USEPA 90-day storage site, thus allowing for less expensive facility construction. The existing site utilities do not support the additional electrical load of this facility; therefore, the current transformer (225 kilovolt amperes [kVA]) would be replaced with a 300 kVA transformer.

The proposed waste storage facility will be operationally separate from the existing TSD facility. Providing the additional space for the universal, non-RCRA and TSCA waste will free up space in Facility 20479 for storage of RCRA waste, including that generated by the new BRAC missions.

Together, the two facilities will meet the combined waste storage capacity needed for all missions in Area B.

2.5.2 *Alternative 2—No Action*

Under the No Action Alternative, it is assumed that the Proposed Action would not be completed. This alternative will serve as a baseline against which the Proposed Action can be compared. Under the No Action Alternative, USAF would maintain the environmental status quo, but would not comply with the 2005 BRAC decisions to realign or close bases. Increased synergies/efficiencies due to consolidations and collocations would not be realized.

2.6 *Pipeline Student Dormitory*

2.6.1 *Alternative 1—Construct a Pipeline Student Dormitory in the Kittyhawk Area (Proposed Action)*

As part of the relocation of missions to WPAFB, a dormitory to house students attending the USAFSAM is required. The dormitory would be a multi-story structure of approximately 52,080 ft². The proposed location of the dormitory has been tentatively identified as an open area between Beech Street and Briar Street (Figure 10). The facility's structure would consist of a reinforced concrete foundation and floor slab, masonry walls, and standing seam metal roof. The pipeline student dormitory would consist of 96 student rooms (housing two students per room), an administrative office, and vending, laundry, storage, lounge, workout, and outdoor recreational areas.

Site preparation activities for construction of the dormitory and associated structures (for example, parking lots) would include vegetation removal, excavation and/or site grading, and compaction of the soil. The areas would be graded so that storm water runoff would flow to existing drainage. Site work would include mechanical (such as water and telephone lines) and electrical utilities located both above and below ground. Paved access (sidewalks) would be provided between the facility and parking lots. Once construction is completed, the site would be landscaped where appropriate.

2.6.2 *Alternative 2—No Action*

Under the No Action Alternative, it is assumed that a new pipeline student dormitory would not be built and adequate living quarters for the students would not be available. This alternative will serve as a baseline against which the Proposed Action can be compared.

2.7 Increase Religious Education Capacity

2.7.1 Alternative 1—Expand Chapel Family Life Center in the Prairies (Facility 20229) (Proposed Action)

The existing base chapels lack religious education and activity space required for families attending religious services. An adequately sized and configured religious education facility is needed to provide flexible space for multi-faith religious education to support of the increased number of base personnel and their families associated with the inbound BRAC missions. Therefore, a 2,000 ft² expansion of the Chapel Family Life Center in the Prairies (Facility 20229) has been proposed. This facility is located in the southern part of Area B along Chapel Lane (Figure 11). The expanded facility would provide multi-purpose spaces for chapel and religious education activities. This facility would be available for chapel use 7 days per week.

Construction components of the expansion of Facility 20229 would include exterior walls, doors, windows, interior spaces and finishes, building systems, demolition, and site work. The expansion would include a reinforced concrete foundation and floor slab, structural steel frame, masonry walls, and roof system.

2.7.2 Alternative 2 – No Action

Under the No Action Alternative, it is assumed that the Proposed Action would not be completed. This alternative will serve as a baseline against which the Proposed Action can be compared.

2.8 Alternatives Eliminated from Further Study

USAF designed the alternatives listed above as reasonable alternatives to be considered for evaluation. During the planning, several other alternatives were considered.

2.8.1 Remote Field Training Site

Two alternate sites were considered for the location of the RFTS. One alternate site is a large open field in Area C located north of Hebble Creek Road, adjacent to the former Small Arms Range and the Huffman Prairie Flying Field (HPFF). This site is undisturbed and would require considerable site development to make it suitable for use as a field training site. Although power, water, and communications infrastructure are potentially accessible nearby, none of these infrastructure components are in place on the site. Bringing these utilities onto the site would require disturbance

of the site, additional time, and expense to the project. This alternate site also offers no measure of isolation or visual screening from Hebble Creek Road or the adjacent HPFF, which is operated by the National Park Service (NPS) and open to the public. Therefore, this alternate location was eliminated as an alternative for the RFTS.

The second site considered for the location of the RFTS consists of open and forested areas adjacent to Tillman Pit (Landfill 2). The Tillman Pit area is located in the southwest portion of Area B near the intersection of Harshman and Airway roads. Like the area near the former Small Arms Range and HPFF, this area offers no measure of isolation or visual screening from areas accessible to the public. Power, water, and communications infrastructure are potentially accessible nearby; however, none of these infrastructure components are in place on the site. Bringing these utilities onto the site would require disturbance of the site, additional time, and expense to the project. Therefore, this alternate location was eliminated as an alternative for the RFTS.

2.8.2 *Vivarium*

Placement of the Vivarium and veterinary/Vivarium services entirely within the future HPW complex was considered. Approximately 9,000 ft² of space would be needed to accommodate the Vivarium. Approximately 7,000 gsf was collocated in Building 838 due to operational efficiencies, and another 2,000 gsf was placed in the HPW due to operational efficiencies. Only 2,000 ft² of space is available because all other space within the HPW complex has been dedicated to other activities. Therefore, this alternative was eliminated from further consideration.

2.8.3 *Waste Storage Facility*

One alternative to the proposed action that was considered was to construct a small storage building adjacent to the new HPW facilities. This building would store all of the RCRA and non-RCRA from future HPW activities. This option is not preferred for the following reasons:

- Such a facility could not be operated as an initial accumulation site since it is, by definition, not “at or near the point of generation” as specified by RCRA regulations. It would therefore, at a minimum, have to be operated as a 90-day storage site. This would increase construction costs significantly.

- The facility would require weekly inspections by either base personnel or waste contractor personnel, and would be subject to annual inspections by USEPA, increasing the compliance burden for WPAFB and the potential for Notices of Violation. If waste contractor personnel are tasked with these inspections, the waste contract would require modification as they are currently responsible for managing two 90-day storage buildings (Facilities 20479 and 30247).
- Storing large amounts of hazardous waste near employee work places reduces the safety of those personnel.

2.8.4 *Pipeline Student Dormitory*

Two alternatives to the construction of a new pipeline student dormitory in the Kittyhawk Community that were considered were converting a permanent party dormitory and constructing the new dormitory in Area B. The existing dormitories at WPAFB do not have the capacity to meet the BRAC requirement, and the pipeline student dormitory is configured differently than a permanent party dormitory (see Section 1.4.1.5). Therefore, converting an existing dormitory to meet the needs of the pipeline students was eliminated from further consideration. Constructing the new dormitory in Area B was eliminated from further consideration because siting the dormitory in the Kittyhawk Community locates the pipeline student dormitory near the existing dormitories at WPAFB, as well as the dining hall. In addition, the dormitory would be in close proximity to other community services (that is, library, post office, chapel, theater, etc.).

2.8.5 *Increase Religious Education Capacity*

Expanding religious education and activity space was considered for an on-base location at Facility 30206. This facility, constructed in 1941, is a combination of administrative and aircraft hangar space. Facility 30206 houses base operations and the airfield control tower. The facility is located in Area C along the flight line and the religious educational space within the building is hard to locate and is not conducive for its intended use. During alert situations, the facility must be secured for base operations activities, which results in the cancellation of any religious education training or activities. Therefore, this location was eliminated as an alternative for increasing religious education facility capacity.

2.9 Selection Criteria for Screening of Alternatives

Although the BRAC process drove the decision to move missions to WPAFB, the decision as to where to place these inbound missions went through a careful siting process. The criteria used to determine potential sites were grounded primarily in the mission objectives of each facility, the need or efficiency gained from locating these facilities in proximity to facilities with related or similar missions, and potential conflicts with adjacent facilities. Secondly, siting considered the objectives of minimizing environmental impacts, reducing impacts to the existing population, such as not increasing traffic congestion, and site improvement costs, including necessary utilities. These project objectives are spelled out in more detail below. These objectives were then used to identify reasonable alternatives, including the Proposed Action.

The operational criteria used to evaluate the potential site for the HPW complex centered on three types of decision criteria. Operational criteria are important to design and location, or are construction features that affect the degree to which the Proposed Action can meet project needs and objective selection of the site location for the HPW complex.

2.9.1 Using Organization Mission Requirements

The Cost of Base Realignment Actions (COBRA) model BRAC facilities program was the starting point for understanding the types of facilities the future users would need at WPAFB.

The Area B Hilltop District became the preferred location for the HPW based on the large projected scope, logical functional relationships to existing AFRL/HE facilities that will also be a part of HPW, and adequate developable land with minimal environmental or operational prohibitions. The model of the new HPW is the “iron triangle,” which is comprised of education, research, and clinical elements. The new HPW is intended to combine many of the related and interwoven functions and capabilities into one campus setting. The intention is to create an atmosphere of collaboration and possible cross-pollination of ideas, processes, and methods. As an extension of the HPW mission, but also requiring physical separation from the main facility, the proposed Vivarium and entomology laboratory are logically sited in Area B.

The relocating Sensors Directorate mission is directly related to the existing Sensors Directorate mission at Facility 20620 in Area B. The purpose of the BRAC is to collocate similar missions to

improve operational efficiency of like missions and reduce operational cost. This purpose clearly requires the collocation of this BRAC mission in Area B near existing Facility 20620.

Similarly, the need for additional waste storage capacity is driven by the HPW mission; hazardous materials transportation cost makes the location of this facility in Area B a logical choice, as well.

All of these facilities have space requirements which can be met in the available space in Area B.

The RFTS requires a site remote from normal activities; sites were considered across the base that would meet this mission requirement. Although it is related to the HPW mission, it does not require close location to the HPW complex during the periodic exercises.

While it must be separate from other dormitories, the pipeline student dormitory will also depend on certain services common to all base residents (such as the dining hall, library, post office, chapel, and theater). These services are concentrated in the Kittyhawk area. The location of the dormitory in the Kittyhawk area is a logical choice for that reason. The pipeline students will require daily access to the HPW facility, but on a regular morning/evening commuting schedule; essentially, their entire day is spent at the HPW with few or no trips needed to the dormitory. Daily transportation of students between Area B and Kittyhawk can be easily accomplished by bus, with minimal impact to the mission, the students, or the transportation system.

Building space to meet religious education needs is most logically located in facilities dedicated or primarily used for religious support, for the ease of use by military and civilian personnel as well as to provide larger capacity in a consolidated location. Therefore, the siting of this facility was focused on the existing chapels and other facilities that are dedicated to religious education, and where expansion would be most easily accommodated and most useful.

2.9.2 WPAFB Planning and Environmental Requirements

The WPAFB General Plan (Woolpert, 2001), the Integrated Natural Resources Management Plan (INRMP; (WPAFB, 2007a), and the Integrated Cultural Resource Management Plan (ICRMP; WPAFB, 2006b) were the primary sources for providing operational and natural, cultural, and

environmental constraints; operational synergies; infrastructure capacity; compatible land use availability; and potential impact to current capital improvements plans.

Each of the sites selected for the Proposed Actions were chosen because they provide a mix of infrastructure capacity, few environmental constraints, and operational synergies. No safety constraints were identified at any of the sites during the selection process.

2.10 Comparison of Environmental Consequences between Alternatives

The impacts associated with the Proposed Action and the alternatives are summarized in Table 3. The information includes a concise definition of the issues addressed under each alternative and the environmental impacts associated with each alternative. The analysis is based on information discussed in detail in Section 4.

TABLE 3
Comparison of Environmental Consequences of the Proposed Actions and Alternatives

| Resources | Remote Field Training Infrastructure | | Sensors Directorate Facility | | Vivarium | | Entomology Laboratory | |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| | Alternative 1—Construct Remote Field Training Infrastructure at Prime BEEF Area (Proposed Action) | Alternative 2—No Action | Alternative 1—Construct New Facility Adjacent to F/20620 (Proposed Action) | Alternative 2—No Action | Alternative 1—Expansion of Facility 20838 | Alternative 2—No Action | Alternative 1—Construct a New Entomology Laboratory In Area B (Proposed Action) | Alternative 2—No Action |
| Natural Resources | | | | | | | | |
| Vegetation | Short-term: Minor, negative impacts during site preparation/excavation activities due to temporary loss of vegetation cover on project areas. Long-term: Nominal impact from loss of vegetation on project area; vegetation is common and temporarily disturbed areas would be revegetated. | Short-term: No impact. Long-term: No impact. | Short-term: Minor, negative impacts during site preparation/excavation activities due to temporary loss of vegetation cover on project areas. Long-term: Nominal impact from loss of vegetation on project area; vegetation is common and site would be revegetated and landscaped. | Short-term: No impact. Long-term: No impact. | Short-term: Minor, negative impacts during site preparation/excavation activities due to temporary loss of vegetation cover on project areas. Long-term: Nominal impact from loss of vegetation on project area; vegetation is common and site would be revegetated and landscaped. | Short-term: No impact. Long-term: No impact. | Short-term: Minor, negative impacts during site preparation/excavation activities due to temporary loss of vegetation cover on project areas. Long-term: Nominal impact from loss of vegetation on project area; vegetation is common and site would be revegetated and landscaped. | Short-term: No impact. Long-term: No impact. |
| Wildlife | Short-term: Minor habitat loss. No unusual or high quality habitats will be affected. Long-term: Minor habitat loss. No unusual or high quality habitats will be affected. | Short-term: No impact. Long-term: No impact. | Short-term: Minor habitat loss. No unusual or high quality habitats will be affected. Long-term: Minor habitat loss. No unusual or high quality habitats will be affected. | Short-term: No impact. Long-term: No impact. | Short-term: Minor habitat loss. No unusual or high quality habitats will be affected. Long-term: Minor habitat loss. No unusual or high quality habitats will be affected. | Short-term: No impact. Long-term: No impact. | Short-term: Minor habitat loss. No unusual or high quality habitats will be affected. Long-term: Minor habitat loss. No unusual or high quality habitats will be affected. | Short-term: No impact. Long-term: No impact. |
| Threatened and Endangered Species | Short-term: No impact. Seasonal construction restrictions will be implemented to avoid impacts to Indiana bat and eastern massasauga rattlesnake. Long-term: No impact. Training will be restricted to developed area. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| Wetlands | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| Water Resources | | | | | | | | |
| Groundwater | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| Surface Water | Short-term: No direct impacts to surface waters. Potential minor impacts during site preparation/excavation. Impacts would be minimized because erosion and siltation controls would be implemented. Long-term: No Impact | Short-term: No impact. Long-term: No impact. | Short-term: No direct impacts to surface waters. Potential minor impacts during site preparation/excavation. Impacts would be minimized because erosion and siltation controls would be implemented. Long-term: No Impact | Short-term: No impact. Long-term: No impact. | Short-term: No direct impacts to surface waters. Potential minor impacts during site preparation/excavation. Impacts would be minimized because erosion and siltation controls would be implemented. Long-term: No Impact | Short-term: No impact. Long-term: No impact. | Short-term: No direct impacts to surface waters. Potential minor impacts during site preparation/excavation. Impacts would be minimized because erosion and siltation controls would be implemented. Long-term: No Impact | Short-term: No impact. Long-term: No impact. |
| Floodplain Issues | Short-term: No impact. No permanent, habitable structures, all improvements at grade. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| Hazardous Materials/Waste, Stored Fuels, and IRP | | | | | | | | |
| Hazardous Materials/Waste | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| Stored Fuels | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| IRP Sites | Short-term: No impacts to FTA1 are anticipated. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No IRP sites are in the vicinity of the proposed action; therefore, there are no impacts. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impacts to EFDZ6 are anticipated because it is outside the project area. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impacts to EFDZ2, EFDZ3, and AOC 79/95 Complex are anticipated because they are outside the project area. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| Land Use | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No Impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| Geology and Soil | Short-term: Potential minor impacts (i.e., soil erosion) during site preparation/excavation activities. Impacts would be minimized because erosion and siltation controls would be implemented. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: Potential minor impacts (i.e., soil erosion) during site preparation/excavation activities. Impacts would be minimized because erosion and siltation controls would be implemented. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: Potential minor impacts (i.e., soil erosion) during site preparation/excavation activities. Impacts would be minimized because erosion and siltation controls would be implemented. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: Potential minor impacts (i.e., soil erosion) during site preparation/excavation activities. Impacts would be minimized because erosion and siltation controls would be implemented. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |

TABLE 3
Comparison of Environmental Consequences of the Proposed Actions and Alternatives

| Resources | Waste Storage Facility | | Pipeline Student Dormitory | | Increase Religious Education Facility Capacity | |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| | Alternative 1—Construct New WSF In Area B (Proposed Action) | Alternative 2—No Action | Alternative 1—Construct a New Pipeline Student Dormitory in the Kitty Hawk Area (Proposed Action) | Alternative 2—No Action | Alternative 1—Expand Facility 20229 (Proposed Action) | Alternative 2—No Action |
| Natural Resources | | | | | | |
| Vegetation | Short-term: Minor, negative impacts during site preparation/excavation activities due to temporary loss of vegetation cover on project areas. Long-term: Nominal impact from loss of vegetation on project area; vegetation is common and site would be revegetated and landscaped. | Short-term: No impact. Long-term: No impact. | Short-term: Minor, negative impacts during site preparation/excavation activities due to temporary loss of vegetation cover on project areas. Long-term: Nominal impact from loss of vegetation on project area; vegetation is common and site would be revegetated and landscaped. | Short-term: No impact. Long-term: No impact. | Short-term: Minor, negative impacts during site preparation/excavation activities due to temporary loss of vegetation cover on project areas. Long-term: Nominal impact from loss of vegetation on project area; vegetation is common and site would be revegetated and landscaped. | Short-term: No impact. Long-term: No impact. |
| Wildlife | Short-term: Minor habitat loss. No unusual or high quality habitats will be affected. Long-term: Minor habitat loss. No unusual or high quality habitats will be affected. | Short-term: No impact. Long-term: No impact. | Short-term: Minor habitat loss. No unusual or high quality habitats will be affected. Long-term: Minor habitat loss. No unusual or high quality habitats will be affected. | Short-term: No impact. Long-term: No impact. | Short-term: Minor habitat loss. No unusual or high quality habitats will be affected. Long-term: Minor habitat loss. No unusual or high quality habitats will be affected. | Short-term: No impact. Long-term: No impact. |
| Threatened and Endangered Species | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| Wetlands | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| Water Resources | | | | | | |
| Groundwater | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| Surface Water | Short-term: No direct impacts to surface waters. Potential minor impacts during site preparation/excavation. Impacts would be minimized because erosion and siltation controls would be implemented. Long-term: No Impact | Short-term: No impact. Long-term: No impact. | Short-term: No direct impacts to surface waters. Potential minor impacts during site preparation/excavation. Impacts would be minimized because erosion and siltation controls would be implemented. Long-term: No Impact | Short-term: No impact. Long-term: No impact. | Short-term: No direct impacts to surface waters. Potential minor impacts during site preparation/excavation. Impacts would be minimized because erosion and siltation controls would be implemented. Long-term: No Impact | Short-term: No impact. Long-term: No impact. |
| Floodplain Issues | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| Hazardous Materials/Waste, Hazardous Materials/Waste | Short-term: No impact. Long-term: A spill containment plan for the facility will be followed; no impacts are anticipated. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impacts. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impacts. | Short-term: No impact. Long-term: No impact. |
| Stored Fuels | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| IRP Sites | Short-term: Potential minor impacts to EFDZ4 associated with construction of the Waste Storage Facility; limited site preparation such as grading and utility tie-ins would be needed. Digging and soil disturbances are allowable in the IRP-impacted sites with approval from Base Civil Engineering and Environmental Management Division personnel. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No IRP sites are in the vicinity of the proposed action; therefore, there are no impacts. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No IRP sites are in the vicinity of the proposed action; therefore, there are no impacts. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| Land Use | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: Land use designation would change from open space to housing unaccompanied. Impacts would be nominal because the land use change would be consistent with the WPAFB General Plan. Long-term: Same as those described for short-term impacts. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |
| Geology and Soil | Short-term: Potential minor impacts (i.e., soil erosion) during site preparation/excavation activities. Impacts would be minimized because erosion and siltation controls would be implemented. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: Potential minor impacts (i.e., soil erosion) during site preparation/excavation activities. Impacts would be minimized because erosion and siltation controls would be implemented. Long-term: No impact. | Short-term: No impact. Long-term: No impact. | Short-term: Potential minor impacts (i.e., soil erosion) during site preparation/excavation activities. Impacts would be minimized because erosion and siltation controls would be implemented. Long-term: No impact. | Short-term: No impact. Long-term: No impact. |

TABLE 3
Comparison of Environmental Consequences of the Proposed Actions and Alternatives

[illegible]

3 Affected Environment

3.1 Introduction

This section identifies existing environmental conditions at WPAFB that could be affected by the Proposed Actions and their alternatives including natural resources, water resources, HAZMAT and HW, stored fuels, IRP, land use, soils, cultural resources, air quality, noise, health and safety, socioeconomics, transportation and traffic, utilities, and environmental justice.

3.2 Natural Resources

3.2.1 Vegetation

Prime BEEF Training Area (Area C)

The PBTA is predominantly an undisturbed area covered with vegetation. Vegetative cover types include routinely mowed, old field, and forested/deciduous habitats. A small portion of the PBTA is covered by roads, man-made structures, and paved or gravel areas (Figure 3). The area of the PBTA that is proposed for the RFTS was visited in October 2007. Observed native trees in and adjacent to the routinely mowed areas included eastern cottonwood (*Populus deltoides*), black locust (*Robinia pseudoacacia*), honey locust (*Gleditsia triacanthos*), hackberry (*Celtis occidentalis*), and willow species (*Salix* spp.). The understory was largely dominated by amur honeysuckle (*Lonicera maackii*) and autumn olive (*Elaeagnus umbellata*). The commonly observed herbaceous species include various species of planted grasses, primarily fescue (*Festuca* sp.), and a number of herbaceous species typical of maintained grass areas, such as dandelion (*Taraxacum officinale*), white and red clover (*Trifolium repens* and *T. pretense*), plantain (*Plantago* spp.). The old field communities contain dominant grasses, mixed shrub species, and early successional hardwood species.

An ecological survey of the PBTA at large was conducted in 1998 (PES/Metcalf and Eddy, 1998). This study identified 92 plants species, most common to this region. The forested areas consist of a variety of canopy species. The most common trees observed were black walnut (*Juglans nigra*), elm (*Ulmus* spp.), eastern cottonwood, willow, ash (*Fraxinus americana*), sycamore (*Platanus occidentalis*), hickory (*Carya* spp.), mulberry (*Morus* spp.), black locust and honey locust. The understory included saplings of the canopy tree species, as well as dogwood (*Cornus* spp.), honeysuckle, osage-orange (*Maclura pomifera*), hawthorn (*Crataegus* spp.), wild grape (*Vitis* spp.),

raspberry (*Rubus* spp.), multiflora rose (*Rosa multiflora*), and sumac (*Rhus* spp.). Areas adjacent to roads, areas with open canopies, and disturbed areas were dominated by honeysuckle and autumn olive and various herbs and vines.

Area B

The project areas in the Area B Hilltop District consist of areas designated by the base as previously disturbed areas. The open spaces where the Sensors Directorate, vivarium, and waste storage facility are proposed are currently maintained as lawns. Vegetation in these areas consists primarily of planted grasses, with few invasive broad-leaf plants (see photographs in Appendix A). Dominant species in the maintained areas include tall fescue (*Festuca arundinacea*), Kentucky bluegrass (*Poa pratensis*), dandelion (*Taraxacum officinale*), and clover (*Trifolium pratense* and *T. repens*) (WPAFB, 2007a). Ornamental, hardwood, and evergreen tree species also are scattered throughout the sites, such as dogwoods (*Cornus* spp.), oaks (*Quercus* spp.), firs (*Abies* spp.), and maples (*Acer* spp.).

The proposed entomology site is disturbed by previous building construction and demolition, although less maintained than the other sites. A gravel lane extends east from the end of 12th Street, which is grassed and occasionally mowed. Ordinary, shrubby growth occurs along the periphery of the mowed area, which was allowed to regrow following building demolitions in 2001. This vegetation includes common species such as eastern cottonwood, honeysuckle, autumn olive, and goldenrods (*Solidago* spp.).

Kittyhawk Community

The proposed location for the construction of the pipeline student dormitory in the Kittyhawk Community consists of lawns and landscaped areas. The proposed location for the dormitory is an existing open space with no buildings or other structures. Vegetation in the areas consists primarily of grasses, shrubs, and ornamental trees (Figure 10). Dominant species include tall fescue, Kentucky bluegrass, dandelion, and clover. Trees and shrubs planted on improved grounds often include white and green ash (*Fraxinus americana* and *F. pennsylvanica*), sweetgum (*Liquidambar styraciflua*), burning bush (*Euonymus alatus compacta*), and viburnum (*Viburnum* sp.) (WPAFB, 2001a).

The Prairies

The Chapel Family Life Center property is also currently maintained as lawn (Figure 11). Vegetation in this area consists primarily of planted grasses, with a few invasive broad-leaf plants. Like other maintained lawn areas, dominant species include tall fescue, Kentucky bluegrass, dandelion, and clover.

3.2.2 Wildlife

Wildlife surveys conducted at WPAFB (BHE Environmental, Inc. [BHE], 1999a) documented the presence of 23 mammals, 99 birds, and 7 reptiles (3 snakes and 4 turtles). Common mammals on base include white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), eastern cottontail rabbit (*Sylvilagus floridanus*), Virginia opossum (*Didelphis virginiana*), beaver (*Castor canadensis*), groundhog (*Marmota monax*), eastern fox squirrel (*Sciurus niger*), eastern gray squirrel (*Sciurus carolinensis*), eastern chipmunk (*Tamias striatus*), and deer mouse (*Peromyscus maniculata*). Common birds on base include European starling (*Sturnus vulgaris*), eastern meadowlark (*Sturnella magna*), barn swallow (*Hirundo rustica*), Savannah sparrow (*Passerculus sandwichensis*), red-winged blackbird (*Agelaius phoeniceus*), Canada goose (*Branta canadensis*), red-tailed hawk (*Buteo jamaicensis*), horned lark (*Eremophila alpestris*), American robin (*Turdus migratorius*), turkey vulture (*Cathartes aura*), mourning dove (*Zenaida macroura*), killdeer (*Charadrius vociferus*), American crow (*Corvus brachyrhynchos*), and mallard (*Anas platyrhynchos*).

Prime BEEF Training Area (Area C)

PBTA is comprised of forested, old field, and routinely mowed habitats. An ecological survey performed in 1998 in the PBTA found 23 species of birds. Predominant were common bird species such as the blue jay, American robin, common grackle, killdeer, mourning dove, northern cardinal, Baltimore oriole, house finch, field sparrow, European starling, and American goldfinch (PES/Metcalf & Eddy, 1998).

Eight species of mammals were observed at PBTA in the ecological survey (PES/Metcalf & Eddy, 1998). These species were the eastern chipmunk, eastern cottontail, eastern gray squirrel, groundhog, raccoon, red squirrel, Virginia opossum, and white-tailed deer. Four common reptile and amphibians also were observed: garter snake, snapping turtle, northern leopard frog, and bullfrog.

Area B

The developed areas that occupy most of Area B provide limited wildlife habitat. Consequently, most of the wildlife in the area is comprised of common species typical of suburban areas. According to the sitewide characterization report (International Consultants Incorporated [ICI] and Science Applications International Corporation [SAIC], 1995), resident mammals commonly found in developed areas of the base include eastern cottontail rabbit, chipmunk, opossum, and gray squirrel. Common birds, such as pigeon (*Columba leucocephala*), killdeer, English sparrow (*Passer domesticus*), mockingbird (*Mimus polyglottos*), and red-winged blackbird, are also typically seen in these areas.

Kittyhawk Community

The area of the proposed pipeline student dorm is predominantly a maintained grassy area with scattered landscape trees and shrubs. A wildlife species composition listed above for Area B would be expected to occur in this area as well.

The Prairies

The Chapel Family Life Center property is a predominantly maintained grassy area and a wildlife species composition listed above for Area B would be expected to occur in this area as well.

3.2.3 Threatened and Endangered Species

Compliance with Air Force Policy Directive (AFPD) 32-70 and AFI 32-7064 requires all USAF installations to protect species classified as endangered or threatened under the Endangered Species Act of 1973 (ESA) and to comply with Ohio Revised Code (ORC) 1531.25 and its implementing regulations for species listed by the state as threatened and endangered. To comply with these requirements, WPAFB developed an Endangered Species Management Plan (BHE, 2001), which has been incorporated into the Integrated Natural Resources Management Plan (INRMP; WPAFB, 2007a). Federal- and/or state-listed species at WPAFB include the Indiana bat (*Myotis sodalis*), bald eagle (*Haliaeetus leucocephalus*), eastern massasauga rattlesnake (*Sistrurus c. catenatus*), clubshell (*Pleurobema clava*, a mussel), and blazing star stem borer (*Papaipema beeriana*, a moth). Copies of correspondence with the Ohio Department of Natural Resources (ODNR) and the U.S. Fish and Wildlife Service (USFWS) regarding the potential occurrences of threatened and endangered species in the project areas are provided in Appendices C and D, respectively.

Indiana bat habitat follows the lower reaches of Hebble Creek, Trout Creek, and the riparian corridor of Mad River from its northern reach in Area A to its confluence with Hebble Creek (ICI/SAIC, 1995; BHE/IT Corporation, 1999). During the late spring and summer months, this species migrates from its winter hibernacula (typically caves or old mines) and roosts under loose bark and in cavities of living or dead trees. Typically, this species forages in riparian and floodplain forests or along forest edges. In July 2000, two Indiana bats (a juvenile female and an adult post-lactating female) were captured along Trout Creek during a basewide mist net survey (BHE, 2001). Radio tracking of these two bats confirmed the presence of a maternity colony in a dead slippery elm (*Ulmus rubra*) in a woodlot on the campus of Wright State University. Recent mist net studies were conducted in July 2007 (AMEC Earth and Environmental, July 2007, unpublished). This survey included a number of netting sites surrounding the project area, both in Area B to the south and east of the project area, and to the north in Area C. Three Indiana bats were captured at two sites in Area C along the Mad River.

The bald eagle recently was removed from the federal list of threatened and endangered species, although it is still a state-listed species. This species is typically found along waterways and impoundments. Although bald eagles may be found year round in Ohio, they only occur on WPAFB as rare winter visitors with most previous sightings having been along the Mad River corridor, which contains potentially suitable winter foraging and roosting habitat (WPAFB, 2007a).

The eastern massasauga rattlesnake is a federal candidate species usually found in wet areas including wet prairies, marshes, and low-lying areas. As well as being a federal candidate species, the eastern massasauga (*Sistrurus catenatus catenatus*) is currently listed as endangered by the State of Ohio.

The eastern massasauga has been recorded at WPAFB, although neither the historical nor current population status of the massasauga rattlesnake at WPAFB has been determined. Reports of massasauga rattlesnake sightings have been limited to the PBTA and Twin Base Golf Course. Because the massasauga rattlesnake is a federal candidate species, there is no requirement to survey construction areas for potential snake habitat.

The clubshell mussel is a federal- and state-listed endangered species occurring in 12 streams in Kentucky, Pennsylvania, Indiana, Ohio, Michigan, and West Virginia. The habitat of the clubshell mussel is not well described, but the species occurs in small rivers and streams in clean sweep sand and gravel (USFWS, 2005). During recent surveys by 3D/International, Inc. (1998) and BHE Environmental (1999a), subfossil remains of the clubshell were documented at the confluence of Trout Creek and Mad River and near the confluence of Mud Run and Mad River (WPAFB, 2007a). Currently, the Mad River is considered to be the only potential habitat for the clubshell at WPAFB.

The blazing star stem borer is a state-listed endangered species occurring only in disjunct populations throughout the Midwestern United States. It is highly dependent upon remnants of mesic tall grass prairies. In 1992, three stem borers were captured at WPAFB's Huffman Prairie. Huffman Prairie is one of three locations where this species has been found in Ohio (WPAFB, 2007a). The species can potentially occur in any old field where its host plant, the blazing star (*Liatris spicata*), occurs. The INRMP shows areas where the blazing star, and thus the blazing star stem borer, may occur, including old fields in the PBTA. The 1998 ecological survey failed to find the blazing star in the area.

The upland sandpiper is a state-listed threatened species normally found in upland habitat. It has been found nesting near the base Aero Club in Area C (ICI/SAIC, 1995).

Prime BEEF Training Area (Area C)

The year 2000 studies of Indiana bats at WPAFB found the PBTA to be within the home range of the Indiana bats captured that year, and designated the woodland at the PBTA to be potentially suitable roosting habitat (WPAFB, 2007a). Subsequently, a recent assessment of the forest habitat in the PBTA (AMEC Earth and Environmental, July 2007, unpublished) found the woodland surrounding the RFTS project area, and most of the woodland at the PBTA, to be of low summer roosting habitat quality for the Indiana bat. Both the studies in 2000 and 2007 included mist netting sites to the east and west of the PBTA along Hebble Creek. During the latter study, one Indiana bat, previously captured and banded along the Mad River, was recaptured along Hebble Creek. This would indicate that the Hebble Creek corridor near the PBTA, at a minimum, is a potential forage area for the bats.

Wetlands and surrounding habitats at the PBTA are potentially suitable for the eastern massasauga. As reported in the INRMP (WPAFB, 2007a), four massasaugas (two males and two pregnant/gravid females) were captured during a survey conducted within and around the PBTA in 1993. No estimate of the total population size could be made at that time. Surveys conducted in the same areas during 1999 found none of the snakes.

Area B

As indicated by ODNR, the pigeon grape (*Vitis cinerea*, a high climbing vine) is located within the southeastern portion of Area B Hilltop District, in the vicinity of the proposed waste storage facility (Appendix C). According to the ODNR, this species typically inhabits moist, open to semi-open situations; it often occurs in alluvial soil: low woods, thickets, fencerows, and stream banks. This species is designated as potentially threatened in Ohio.

According to correspondence with the ODNR, there are no records of the eastern massasauga rattlesnake, Indiana bat, clubshell mussel, or the bald eagle within Area B. The recent surveys for the Indiana bat included mist net sites in Area B. No bats were found in Area B in either 2000 or 2007. The 2006 assessment of woodlands in Area B found those near the project sites to be of low summer roosting habitat quality for the Indiana bat.

Habitats suitable for the eastern massasauga, clubshell mussel or bald eagle are not present near any of the project sites in Area B.

Kittyhawk Community

No threatened or endangered species are known to occur within this project area according to the ODNR Natural Heritage Program (Appendix C). The maintained lawn habitat is not suitable for any of the species known to occur in the vicinity of WPAFB.

The Prairies

No threatened or endangered species are known to occur within this project area according to the ODNR Natural Heritage Program (Appendix C). The maintained lawn habitat is not suitable for any of the species known to occur in the vicinity of WPAFB.

3.2.4 Wetlands

According to recent guidance from the U.S. Army Corps of Engineers (USACE) and USEPA (2007), wetlands that have a significant nexus to traditionally navigable waters are regulated under Sections 401 and 404 of the Clean Water Act (CWA). A significant nexus must meet a number of criteria that indicates the wetland provides biological, physical, or chemical benefits to the navigable water. Typically, a significant nexus requires a surface water connection to the navigable waters or a relatively permanent tributary. Impacts to these wetlands must be permitted by USACE and possibly also the Ohio EPA (see Section 3.3.2).

Isolated wetlands that may not be regulated under the Clean Water Act are regulated by Ohio EPA under the Ohio Isolated Wetlands Law.

All wetlands, regardless of their surface connections, are regulated pursuant to Executive Order (EO) 11990, Protection of Wetlands. This EO requires consideration of alternatives that do not impact wetlands and mitigation for any unavoidable wetland impacts.

A wetland delineation was conducted on WPAFB in 2004 (BHE, 2005). In Areas B and C, 44 wetlands covering approximately 20.5 acres were identified and delineated.

Prime BEEF Training Area (Area C)

Based on the wetland delineation conducted in 2004, no wetlands are located within the limits of proposed RFTS; however, wetland C18 is located approximately just west of the project area (Figure 3). According to the INRMP, Wetland C18 is a palustrine forested wetland that is seasonally flooded by Hebble Creek to the north. Wetland C18 is the largest wetland on the installation and supports a diversity of vegetative cover types. C18 is a Category 2 wetland according to the Ohio EPA's Rapid Assessment Method (ORAM).

Area B

Based on the wetland delineation conducted in 2004, there are no wetlands located within 500 feet of any of proposed project sites within Area B.

Kittyhawk Community

Based on the wetland delineation conducted in 2004, no wetlands are located in the vicinity of proposed site for the pipeline student dormitory. The entire site is mowed lawn with occasional landscape trees and shrubs.

The Prairies

Based on the wetland delineation conducted in 2004, no wetlands are located in the vicinity of the Chapel Family Life Center property. The entire site is mowed lawn.

3.3 Water Resources

3.3.1 Groundwater

Groundwater within WPAFB occurs under both unconfined water table conditions within the Mad River buried valley aquifer, and under confined to semiconfined conditions within low permeable deposits, primarily within Area B. The underlying bedrock is primarily low permeable shale and does not constitute an aquifer (Dumouchelle et al., 1993).

The Mad River buried valley aquifer is part of the larger Miami Valley buried aquifer that supplies drinking water to much of southwestern Ohio. This aquifer underlies all of WPAFB and surrounding areas. The Miami Valley buried aquifer has been designated a sole source aquifer by USEPA, meaning it is the primary water supply for a significant portion of the population in the region.

Prime BEEF Training Area

The PBTA is located over the Mad River buried valley aquifer. In the area of the PBTA, the aquifer is categorized as a heterogeneous unconfined aquifer because of the discontinuous nature of fine-grained deposits in the subsurface. West of Huffman Dam, fine-grained deposits become more extensive and the aquifer is reported to be separated into upper and lower zones (Geraghty & Miller, 1987). Groundwater occurs under water table conditions within the buried valley aquifer. The aquifer extends vertically from the water table to the bedrock surface. The shale bedrock in the region consists of very low permeability material and does not constitute an aquifer (Dumouchelle et al, 1993). The aquifer reaches a maximum thickness of approximately 230 feet in the central portions of the bedrock valley, but thins to only a few feet at the edges of the buried valley near the PBTA.

Groundwater extraction in the vicinity of the PBTA occurs at extraction well EW-1 located to the northwest along Riverview Road, the City of Dayton Huffman Dam wellfield, and at the Rohrer's Island wellfield.

Area B

Groundwater in Area B occurs under unconsolidated water table conditions (Mad River buried valley aquifer, as described above) and in bedrock, at depths ranging from just below the surface to 35 feet below ground surface (bgs; IT Corporation, 1997a). The water-bearing bedrock zone in this region of Area B is part of the "Hill" aquifer as defined in the *Groundwater Flow Modeling Technical Memorandum* (IT Corporation, 1997b) and is of low hydraulic conductivity. The groundwater flow pattern through this region is created by a bedrock ridge that trends northwest from the southeast corner of Area B to Huffman Dam (Dumouchelle et al., 1993).

The Hill aquifer in Area B is not directly used as a drinking water supply and is not a major source of recharge to the Mad River buried valley aquifer system. Area B is supplied water from four WPAFB-owned and operated wells located near Springfield Street; these wells obtain water from the Mad River buried valley aquifer. The City of Dayton's Mad River wellfield, located along the Mad River northwest of Area B, is one of several other wellfields that withdraw drinking water from the aquifer.

Kittyhawk Community

The water table aquifer in Area A is part of the Mad River buried valley aquifer system. The unconsolidated water table aquifer material underlying the proposed pipeline student dormitory is predominantly comprised of alluvial deposits including sands and gravels with lenticular beds of gravels, and silts and clays. The water table aquifer in Area C, located hydraulically downgradient of Area A, yields water prolifically and has been used as a drinking water supply. Groundwater in this area is recharged through infiltration of precipitation, groundwater flow into the area, and infiltration of surface water. Groundwater occurs at approximately 32 feet bgs and flows west toward the Mad River.

The Prairies

Groundwater in this area occurs approximately 18.5 feet bgs and flows west toward the Mad River. Groundwater in this area is not used as a source of drinking water. The Montgomery County Sanitary Engineering Department supplies drinking water to the Prairies area. This site is not located within any wellfield recharge or designated protection zones.

3.3.2 Surface Water

WPAFB covers over 8,100 acres of diverse natural, suburban, and urban habitats. The average annual precipitation is approximately 38 inches, and the storm water system drains to the tributaries and main branch of Hebble Creek, Trout Creek, and the Mad River (Figure 2). WPAFB has established a Storm Water Pollution Prevention Team to manage storm water issues and prevent pollution. The base implements a Storm Water Management Plan (SWMP), a base-wide Storm Water Pollution Prevention Plan (SWP3), and construction site-specific SWP3s to comply with applicable federal and state regulations (Shaw Environmental, 2007).

Permits are required for discharges of storm water from construction sites. Storm water runoff from construction activities has the potential to impact water quality by contributing sediment and other pollutants exposed at construction sites. The National Pollutant Discharge Elimination System (NPDES) Storm Water Program requires operators of both large and small construction sites to obtain authorization to discharge construction storm water under a general permit. Under the Phase II rule, a permit would be required for a construction site involving greater than 1 acre of land. A Notice of Intent (NOI) serves as the application of the general permit. As part of the NOI application, an SWP3 must be submitted that specifies the erosion control measures to be taken. Regular monitoring would be required to ensure that these measures are implemented and effective in erosion control.

Prime BEEF Training Area (Area C)

Hebble Creek flows west along the south side of Hebble Creek Road and Marl Road near the PBTA. Access to the PBTA is from Marl Road by way of a crossing of Hebble Creek. All of the PBTA drains naturally to Hebble Creek. WPAFB has an NPDES permit (Permit No. 11O00001*CD) with

an outfall (Outfall 004) immediately adjacent to the PBTA. Outfall 004 is located at the bridge which forms the entrance to the PBTA.

Area B

Surface waters in Area B are limited to small unnamed tributaries to Hebble Creek in the Hilltop District. There are no surface waters in or adjacent to any of the proposed project areas in Area B.

Storm drainage from Area B is collected by a combination of surface drainage and storm drains and routed to surface waters. Storm water from most developed areas in Area B is captured by shallow drainages and catch basins, and then routed through underground storm sewer lines or open drainages to one of five outfalls: Outfalls 001, 002, 003, 004 (Mad River), and 005 at Hebble Creek. In addition, two site-specific discharge points, Outfalls 22 and 23, occur within Area B. Outfall 22 collects final effluent from the coal pile runoff treatment facility (near Facility 20770) and discharges to unnamed tributaries of Hebble Creek. Outfall 23 collects storm water from the aircraft survivability test area after flowing through an oil/water separator, and discharges to an unnamed tributary of the Mad River (Shaw Environmental, 2006).

Potential impacts to water quality from storm water discharge are regulated under Section 402 of the CWA, also known as the NPDES. Ohio EPA administers this section in Ohio.

Kittyhawk Community

The only surface water feature in the vicinity of the site is an unnamed drainage ditch located approximately 1,000 feet south west of the pipeline student dormitory location. Surface water flow in the drainage ditch is from east to west. This unlined ditch receives surface water runoff from the parking lots, buildings, and lawns in the Kittyhawk Community prior to discharging through Outfall 12 into the concrete-lined drainage channel that forms Hebble Creek.

The Prairies

No surface water features occur within the vicinity of the Chapel Family Life Center property. Storm water runoff from this area is collected by a storm drains and routed toward Lilly Creek.

3.3.3 Floodplains

Floodplains are protected under EO 11988, Protection of Floodplains. This order requires federal agencies to consider alternatives to proposed actions that would not affect the storage capacity or other water quality and habitat benefits provided by floodplains. The extent of this protection extends to the limit of the 100-year floodplain, which is typically determined from the Flood Insurance Rate Maps (FIRM) produced by the Federal Emergency Management Agency (FEMA).

WPAFB is located within the Mad River Valley of the Great Miami River Basin. The extent of the 100-year floodplain along the river is affected by the Huffman Dam. The Huffman Dam is located along the Mad River just west of Area C. The Huffman Dam was constructed in the early 20th century by the Miami Conservancy District as one of several flood “retarding basins” to protect the Dayton metropolitan area from high flood events, following the massive flooding of 1913. Much of Areas A and C are in the Huffman Dam retarding basin. Area B and the Prairies are located below or otherwise beyond the Huffman Retarding Basin.

The FIRM shows the 100-year floodplain above Huffman Dam around 818.6 feet above mean sea level (msl). This study was amended with a 1994 study by USACE, which calculated the 100-year floodplain elevation to be 814.3 feet msl for the Huffman retarding basin. The revised study was accepted by the Miami Conservancy District, as the FEMA-designated local floodplain management agency, in October 1994.

The determination of the extent of the floodplain outside of Area C is taken from the FIRM. Previous correspondence with the Miami Conservancy District for the BRAC projects confirms the following determinations (Appendix E).

Prime BEEF Training Area (Area C)

The PBTA is located above the Huffman Dam at an elevation between 790 and 800 feet msl. Therefore, it is entirely located within the 100-year floodplain of the Huffman retarding basin.

Area B

Area B is located below the Huffman Dam, and therefore the extent of the floodplain was determined from the FIRM. Community Panels 390193 0025C and 390193 0005 B for Greene

County, Ohio, show that all of the proposed project sites within Area B are located outside of the 100-year floodplain.

Kittyhawk Community

The proposed location of the pipeline student dormitory is above the Huffman Dam. At an elevation of about 835 feet msl, the proposed location of the dormitory is located outside of the Mad River 100-year floodplain as determined by the USACE 1994 study.

The Prairies

The Chapel Family Life Center property is below the Huffman Dam. Community Panels 390193 0025C and 390193 0005 B for Greene County, Ohio, show the site is located outside of the Mad River 100-year floodplain.

3.4 Hazardous Materials/Waste, Stored Fuels, and Installation Restoration Program

3.4.1 Hazardous Materials/Waste

Hazardous substance management at WPAFB is governed by WPAFB Operating Instruction 32-7002, *Hazardous Materials*, and WPAFB Operating Instruction 32-7001, *Hazardous Wastes*. As used in this section, HAZMAT is used to refer to hazardous materials and HW is used to refer to hazardous waste. HAZMAT most commonly used at USAF bases include aviation and motor fuels; numerous types of petroleum products such as motor oils, lubricants, and hydraulic fluids; cleaning solvents and agents; pesticides and herbicides; paints and paint thinners; acids; corrosives; caustics; compressed gases; aerosols; fire retardants; and munitions.

HW commonly generated at the base includes used flammable solvents, contaminated fuels and lubricants, paint/coating, stripping chemicals, and waste paint-related materials. Each waste-generating organization and the Environmental Management Division (88 ABW/CEV) is responsible for managing HW. There is one 90-day storage area located at WPAFB: Facility 30247 in Area C. Facility 20479 in Area B is licensed as a 1-year TSD facility under the WPAFB RCRA Part B permit; however, it has historically been and is currently operated as a 90-day storage area.

3.4.2 *Stored Fuels*

WPAFB contains both aboveground storage tanks (ASTs) and underground storage tanks (USTs), which are used to store fuels and petroleum, oils, and lubricants (POL). USTs are subject to federal regulations implementing RCRA, contained in 40 CFR Part 280. The State of Ohio regulates USTs under Ohio Administrative Code (OAC) 1301:7-9. ASTs are regulated under the federal Oil Pollution Prevention and Response Regulation and the WPAFB Spill Prevention Control and Countermeasure (SPCC) Plan.

Prime BEEF Training Area (Area C)

There is an abandoned 5,000-gallon capacity steel AST No. 233 located at Building 30881. This tank previously stored 50 percent hydrogen peroxide used in sewage treatment. This tank is no longer being used and efforts are underway to remove the tank and turn it in to the Base Recycling Center to be recycled as scrap metal.

UST No. 34, a 550-gallon diesel tank used for emergency power generation was removed at Building 30882. In reviewing the tank closure file, no records were found that indicate samples were taken at the time of removal. The tank was mostly likely abandoned in the late 1980s and removed sometime thereafter.

Area B

Add/Alter Facility 20620 Project Area

Based on a review of the base UST and AST location maps, there are no USTs located at Facility 20620. Five ASTs are located at Facility 20620 – one on the west side of the facility (AST 171) and four on the east side of the facility (ASTs 201, 202, 203, and 677). AST Nos. 201, 202, and 203 store liquid nitrogen, not fuel. The following three USTs are reported as previously removed at Facility 20620:

- UST No. 328 – 500-gallon diesel used for emergency power generation
- UST No. 27 – 550-gallon diesel used for emergency power generation
- UST No. 147 – 550-gallon used for emergency spill containment

Vivarium Project Area

Based on a review of the base UST and AST location maps, there are no USTs located at Facility 20838. AST No. 584 is an active 2,000-gallon diesel storage tank located at Facility 20838. AST No. 174 is located at Facility 20838 along Q Street. Three ASTs (177, 178, and 321) are located at adjacent Facility 20837, and three ASTs (288, 298, and 299) are located at adjacent Facility 20824. AST Nos. 321, 288, 298, and 299 store hydraulic oil, not fuel.

Entomology Site Project Area

Based on a review of the base UST and AST location maps, there are no USTs or ASTs located at the proposed site of the entomology laboratory. AST No. 289, located approximately 300 feet northwest of the project area, was previously used for storage of liquid oxygen and is not presently in use. UST No. 118 is located approximately 400 feet north of the project area.

Waste Storage Facility Project Area

Based on a review of the base UST and AST location maps, there are no USTs or ASTs located at the proposed site of the waste storage facility. One AST (667) is located approximately 600 feet southwest of the project area.

Kittyhawk Community

Based on a review of the base UST and AST location maps, there are no USTs or ASTs located at the proposed site of the pipeline student dormitory. One AST (615) is located east of the proposed project area at the auto skills facility. The status of UST No. 324, a 500-gallon used oil tank listed as located at Building 31244, is uncertain.

The Prairies

Based on a review of the base UST and AST location maps, there are no USTs or ASTs located at the Chapel Family Life Center property. Five ASTs (388 through 392) are located within 200 feet west of the center at the community swimming pool. AST Nos. 388, 389, 390, and 391 are located at Building 20240 and store liquid chlorine, not fuel. An old Army and Air Force Exchange Service (AAFES) gas station was previously located at Building 20233, which is approximately 350 feet northeast of the proposed site. UST Nos. 169, 103, and 68, each of 10,000-gallon capacity storing gasoline, were removed at Building 20233 in late 1994 or early 1995.

3.4.3 *IRP Sites*

The DoD developed the IRP to identify, assess, and control potential environmental contamination that may have resulted from past operations and waste disposal practices. The IRP, an element of the Defense Environmental Restoration Program, is a part of the environmental program at each DoD installation. WPAFB has identified 68 IRP sites per the Air Force Restoration Information Management System (AFRIMS). WPAFB has grouped all confirmed or suspected sites requiring investigation and characterization in 11 geographically based operable units (OUs), designated OUs 1 through 11 (IT Corporation, 1999). In addition to the 11 OUs, WPAFB addressed basewide issues of groundwater and surface water contamination under the Basewide Monitoring Program (BMP; IT Corporation, 1995a).

Prime BEEF Training Area (Area C)

A large portion of the PBTA is located within the boundary of OU5. OU5 consists of the following IRP sites: Landfill 5 (LF5), Fire Training Area 1 (FTA1), the Gravel Lake Tanks Site (GLTS), and Burial Site 4 (BS4). An environmental investigation of OU5 was completed in 1995, the results of which are documented in the *Final Remedial Investigation (RI) Report, Wright-Patterson Air Force Base, Operable Unit 5, Ohio* (IT, 1995b). Of the IRP sites within OU5, FTA1 is located in the PBTA (Figure 12). Documentation for FTA1 can be found in the *Record of Decision for 21 No Action Sites* (WPAFB, 1998). FTA1 consists of a grassy area and gravel roads, some buildings and temporary structures. Based on the Land Use Control Plan (Shaw, 2006), FTA1 has a category “2” land use restriction, which means that “digging, construction, and other soil disturbances are allowable after approval by CE (Civil Engineering) and Environmental Management Division personnel; area subject to use restriction.”

Area B

A large portion of the Area B Hilltop District lies within the boundary of OU9 (Figure 13). OU9 is a collection of 11 discrete IRP sites, nine of which have been used for the disposal of earthfill materials (earthfill disposal zones [EFDZs] 2, 3, 4, 5, 6, 7, 8, 9, and 10), one burial site (BS3), and one heating plant (HP5). An environmental investigation of OU9 was completed in 1997, the results of which are documented in the *Final Remedial Investigation Report, Operable Unit 9* (IT Corporation, 1997a) and the *Record of Decision for 41 No Action Sites* (WPAFB, 1998).

Add/Alter Facility 20620 (Sensors Directorate) Project Area

There are no IRP sites within the lawn or parking lot areas at Facility 20620. Three IRP sites are located near Facility 20620 – EFDZ5, a grassy open area, is located to the north; EFDZ9, a wooded area, is located to the west; and EFDZ10, a grassy open area and paved parking lot, is located to the south. Based on the Land Use Control Plan (Shaw, 2006), a category “2” land use restriction has been placed on these three IRP sites.

Vivarium Project Area

There are no IRP sites within the proposed expansion area of Facility 20838. EFDZ6, a grassy open area and parking lot, is located just east of Facility 20838. Based on the Land Use Control Plan (Shaw, 2006), a category “2” land use restriction has been placed on EFDZ6.

Entomology Site Project Area

There are no IRP sites within the proposed construction area of the entomology laboratory. EFDZ2, a grassy open area, is located immediately to the north and EFDZ3, a grassy open area, is located immediately to the south of the site. Based on the Land Use Control Plan (Shaw, 2006), a category “2” land use restriction has been placed on EFDZ2 and EFDZ3.

The proposed location of the entomology site is on the western edge of the former Building 79A-D/95 complex. This site is considered an area of concern (AOC) under the IRP. The former Building 79A-D/95 complex was constructed in 1944 and was used as a jet and rocket engine test facility. Rocket testing was moved to a more remote base in the late 1950s. Experimental propulsion research continued through the 1980s. The building complex was demolished in late 2001. Although not a formal IRP site, the former Building 79A-D/95 complex has been investigated under the IRP. Soil and groundwater at the site have been sampled for possible contamination. Trichloroethylene (TCE) and other solvents such as benzene and cis-1,2-dichloroethylene have been found in the shallow groundwater at the site. A Preliminary Assessment of the site was completed in 2001 (IT, 2001), and a Site Investigation Report was completed in 2006 (Shaw, 2006).

Waste Storage Facility Project Area

The proposed location of the waste storage facility lies within EFDZ4, a grassy open area with paved streets. Based on the Land Use Control Plan (Shaw, 2006), a category “2” land use restriction has been placed on EFDZ4.

Kittyhawk Community

The proposed location for the construction of the pipeline student dormitory is not located within or near any OU or IRP site.

The Prairies

The Chapel Family Life Center is not located within or near any OU or IRP site.

3.5 Land Use

WPAFB is divided into three areas: A, B, and C. Areas A and C are located within the boundaries of Patterson Field. The land use in Area A is mixed between administrative offices, housing, industrial, medical services, and outdoor recreation. Land use in Area C includes activities associated with airfield operations and maintenance, as well as industrial, community commercial, community service, administration, outdoor recreation, and open space. Land use in Area B, or Wright Field, primarily consists of research and development. The base encompasses 8,145 acres and is classified as non-industrial with mixed development (Woolpert, 2001).

Prime BEEF Training Area (Area C)

Land use in the PBTA is currently designated as industrial and open space. The portion of the PBTA that is the proposed location of the RFTS is designated industrial. As discussed in Section 2.1, activities at the PBTA are restricted to only disturbed areas.

Area B

Several of the project areas are located in a part of Area B referred to as the Hilltop District (the property primarily occupies the hilltop portion of Area B). Much of this land was acquired during World War II for wartime space requirements. The Proposed Actions in the Hilltop District are located on lands currently designated as follows:

- **Research and Development**—The project areas for the add/alter Facility 20620 (Sensors Directorate), the Vivarium addition at Facility 20838, and the construction of the entomology site are designated Research and Development in base general plan. Area B primarily consists of research and development activities. The central portion of Area B has many “industrial style” research and development facilities primarily used for propulsion and air vehicles research. The eastern half of Area B includes more research and development facilities including materials and manufacturing, a portion of HE (Human Effectiveness), and the Sensors Directorate laboratory.
- **Open Space**—The project area for the waste storage facility is designated open space. Open space is the one of the dominant land uses in the Area B Hilltop District. Areas of open space on the east end of Area B are scattered between research facilities along P Street, Q Street, and Skyline Drive. Much of the open space is intended to be redeveloped. Some areas are undeveloped for several reasons, including cultural resource constraints (Woolpert, 2001).

Kittyhawk Community

The proposed location of the pipeline student dormitory is situated in an area currently classified as open space. This area consists of an open lawn. Land use surrounding this area is classified as outdoor recreation, housing unaccompanied, and community service (Woolpert, 2001).

The Prairies

The Chapel Family Life Center is located in an area currently classified as community service. Land use surrounding this area is classified as outdoor recreation and housing accompanied (Woolpert, 2001).

3.6 Geology and Soil

Most of WPAFB overlies a buried Pleistocene valley. Pre-glacial Teays Stage and interglacial Deep Stage drainage systems eroded this valley down to Paleozoic Era shale (Ordovician) and limestone (Silurian). These valleys were subsequently filled and obscured by outwash and till deposits during the most recent (Wisconsinan) glaciation and by alluvium deposited by modern streams in the area. The deep, porous glacial and alluvial deposits contain the Buried Valley Aquifer, a major source of drinking water to the area (see sections 3.3.1 and 3.13.2).

Soils that occur in each of the project areas are characterized based on the mapping and descriptions provided in the *Soil Survey of Greene County, Ohio* (USDA, Soil Conservation Service, 1978), and the *Soil Survey of Montgomery County, Ohio* (USDA, Soil Conservation Service, 1976).

Prime BEEF Training Area (Area C)

The soil types in the PBTA area are Sloan-Fill Land Complex (Sp) and Ockley-Urban Land Complex, undulating (OdB). The Sloan series occupies the majority of the PBTA area. This complex is made up of nearly level soil on flood plains where as much as 50 percent of the original soil has been covered by fill. The fill areas have three to five feet of fill material that contains mostly Sloan soils and some Westland and Linwood soils. Suitability of the fill material for plant growth is variable and as a result, this complex is used mostly for non-farm purposes. The Ockley Complex occupies the southern portion of the PBTA and consists of nearly level to gently sloping well drained soils that have been disturbed or buried by earthmoving and fill activities. Well drained Rush and Eldean soils are located within this Ockley soil type in areas that have not been disturbed.

Area B

The soils (0 to 5 feet bgs) in the proposed project areas are primarily composed of silt to clay loam belonging to the Miamian Series.

The dominant soil types surrounding the proposed sites in Area B are Miamian-Urban land complex, rolling (MrC) and undulating (MrB). Soil types MrC and MrB typically have from 40 to 80 percent of the land surface covered with pavement and earthfill, and the remaining areas are undisturbed Miamian soils. Miamian Series soil consists of nearly level to steeply sloped soil that formed in glacial till. The surface soil consists of brown silty clay loam from 0 to 7 inches deep, yellowish brown clay and clay loam from 7 to 24 inches deep, and brown loam from 24 to 32 inches deep. The substratum is yellowish brown loam and is encountered at depths of 32 to 60 inches. These soils exhibit moderately low permeability and are well-drained. The depth to bedrock is expected to be approximately 5 feet or less and would be verified during the exploratory borings prior to construction.

Kittyhawk Community

The soils in the vicinity of the student pipeline dormitory are of the Miamian-Urban land complex (MrB) and are comprised of gently sloping glacial till soils. Typically, about 25 to 50 percent of this soil type is borrow and fill in developed areas; undeveloped areas are Miamian soils, as described above for Area B.

The Prairies

Soils in the vicinity of the Chapel Family Center are Miamian silt loam (MIB), as described above for the Area B.

3.7 Cultural Resources

Cultural resources consist of archaeological sites, buildings, structures, districts, properties of traditional and cultural importance, and cultural landscapes that are significant to American history, architecture, archaeology, engineering, and culture. According to the NRHP criteria as defined in 36 CFR 60.4, significant sites or properties are those that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and are shown to be significant for one or more of the following four criteria for evaluation:

- **Criterion A—Events:** Properties associated with events that have made a significant contribution to the broad patterns of our history
- **Criterion B—Persons:** Properties associated with the lives of persons significant in our past
- **Criterion C—Design:** Properties that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction
- **Criterion D—Information:** Properties that have yielded or may be likely to yield information important in prehistory or history

Properties considered significant according to these criteria are eligible for listing on the NRHP. Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effect of any undertaking on these cultural resources. WPAFB has completed an extensive

inventory of historic and prehistoric resources within all project areas prior to the start of this EA. The studies to date and the resources identified are described in the ICRMP (WPAFB, 2006b).

3.7.1 Historic Buildings, Structures

Inventories of buildings that were constructed throughout the base through 1956 (at or approaching 50 years old or older) have identified the facilities that are potentially eligible for listing on the NRHP. Continuing surveys are being programmed to evaluate other facilities as they approach 50 years of age. The SHPO has reviewed all of the facility survey information WPAFB has collected and on January 25, 1999, reached a consensus determination of eligibility for listing on the NRHP for facilities at WPAFB.

Remote Field Training Site

According to current inventories, there are no historic structures at the PBTA. The site is located along Hebble Creek Road, approximately 0.5 mile from the HPFF, a National Historic Landmark that is listed on the NRHP. The HPFF is the site of research and development of powered flight by the Wright Brothers in 1904-1905, and who later used the site in 1910-1916 as an aviation school. The site is owned by the Air Force but is operated by the NPS as part of the Dayton Aviation Heritage National Historical Park (DAHNP). The site is open to the public via unrestricted access from SR 444.

Area B

Historic Buildings and the Wright Field Historic District

The majority of Area B west of Skyline Drive and north of 13th Street has been designated as the Wright Field Historic District, because of the density of historic buildings that are eligible for listing on the NRHP and overall historic integrity of this area (Figure 14). Many historic buildings and other features in this district date to the original Wright Field era (1925–1939) and the Army Air Forces era (1940–1945). The Wright Field Historic District was determined eligible for listing on the NRHP on January 25, 1999; therefore, all “contributing features” in the Historic District are provided protection under Section 106 of the National Historic Preservation Act.

Wright Field also has been designated a cultural landscape in accordance with NPS Preservation Brief 36 (Birnbaum, 1994). Cultural landscapes are areas where the view of the historic landscape

has been preserved and incorporates important historic features. Features considered in the designation of this area as a historic landscape are overall site organization according to Quartermaster Corps principles, response to natural features (such as topography, weather patterns, and water features), circulation system (roadways, railways, parking lots, etc.), land use areas, building cluster arrangements, and vegetation.

The entomology laboratory is proposed to be located at a site within the Wright Field Historic District. The site was formerly occupied by several small research structures (20079A-20079D), the former Building 79A-D/95 complex. These structures were demolished and the site regraded in 2001; it is currently vacant. However, there are two historic features near the entomology site (Figure 13). Nearby Facility 20079 (a jet propulsion laboratory built in 1944) is considered a contributing historic building to the Wright Field Historic District. The sloping accelerated runway, built for research during World War II, also is a contributing feature to the Historic District. While it is being preserved, there are several designated roadways that cross the accelerated runway.

The Sensors Directorate Facility 20620 (aka the avionics building, built 1967) was determined eligible for listing to the NRHP on January 25, 1999. This building is one of seven considered exceptionally significant for their contributions to stealth technology development. Despite the fact that it is not 50 years old, it is considered eligible because of its significance to the Cold War Era. It is the only one of the seven Cold War Era buildings in the proposed BRAC project areas.

Located about 300 feet east of Facility 20479 (the existing hazardous materials storage building), Site 33-GR-1021 was identified as a structure in 1993, and two foundation features were identified in 1996 (Earth Tech, 1996). A total of 75 historical artifacts, including wire nails, clear container glass, and rusted metal, were recovered during the 1996 investigations. The 2004 Phase II testing recovered 140 historical artifacts that were similar to those collected in 1996. The site may be associated with agricultural activities rather than a homestead because the collected artifacts lacked architectural or domestic materials. The site has undergone significant disturbance and was determined to be ineligible for the NRHP in 2004.

The proposed Vivarium addition to Facility 20838 is neither located in the historic district nor near any historic buildings or structures.

Kittyhawk Community

According to current inventories, there are no historic structures or districts in the area of the proposed pipeline student dormitory.

The Prairies

According to current inventories, there are no historic structures or districts in the area of the proposed Chapel Family Life Center addition.

3.7.2 *Archaeological Resources*

Developed areas of WPAFB, or areas which were formerly developed but are now vacant, comprise approximately 63 percent of the base's area. These areas are categorically considered unlikely to yield significant archaeological artifacts because of the severity of past disturbance. Archaeological studies were conducted over the remaining, undeveloped areas of the base from 1990 through 2006. Consequently, the entire installation is regarded as having been surveyed for archaeological resources.

Prime BEEF Training Area (Area C)

The Great Lakes Archaeological Research Center, Inc. (GLARC, 1996) performed a study of a 945.3-acre area of WPAFB, including areas around the PBTA. This study identified two sites in the PBTA area, one is attributable to the Woodland period (33-GR-924), and one the Late Woodland period (33-GR-923). Sketch maps of the sites in their report show the extents and locations of these sites relative to current built features. Site 33-GR-923 was located about 0.25 mile west, and 33-GR-924 approximately 600 feet south of the main training area. GLARC recommended further testing of each of these sites to determine NRHP eligibility. The SHPO concurred with GLARC's recommendations for further testing of these sites in a letter dated December 24, 1997.

A Phase II site assessment of these sites was undertaken by ASC Group in May and June 2004 and completed in July 2005. Site 33-GR-923 was recommended as ineligible for the NRHP based on soil disturbance at the site and the redundant cultural information collected. Based on the location and artifact assemblage of site 33-GR-924, ASC Group concluded that the site might contain significant information concerning Middle Woodland Hopewell habitation in the Great Miami River Valley, and recommended the site as potentially eligible for the NRHP. The approximate limits of site 33-

GR-924 are shown on Figure 3. Additional evaluation of the site is programmed for fiscal year (FY) 2010.

Area B

The Hilltop District and the majority of the built area in Area B have been surveyed or determined to have a low likelihood of containing archaeological artifacts because of past disturbance. In 1990, the U.S. Army Construction Engineering Research Laboratory (USACERL) conducted a prehistoric survey covering 400 acres located in the Hilltop District area (Figure 14). The following three prehistoric archaeological sites were discovered: 33 GR 796, 33 GR 797, and 33 GR 798. In August 2002, Hardlines Design Company conducted Phase II testing of these three sites, and WPAFB concluded, with SHPO concurrence, that the three sites were not eligible for the NRHP.

In October through December 2001, Gray & Pape, Inc. conducted Phase I investigations at WPAFB as a part of the base's ongoing Section 110 responsibilities for identifying and protecting historic properties on its land. The project was focused on identifying potential prehistoric resources in areas previously identified as having a low to moderate probability for containing prehistoric sites. An area between National Road and Q Street was surveyed, and Site 33 GR 1171 was discovered, but it lacked research potential because of its light density of cultural remains. WPAFB determined the site to be ineligible for the NRHP, and SHPO concurred in a letter dated April 5, 2002.

As a result of these surveys, the only known NRHP-listed archaeological resources located within Area B are the Adena mound (Site 33 GR 31) and the Memorial Mound Group (Site 33 GR 30) (Figure 14). Neither of these sites is in the vicinity of any of the proposed projects. The proposed sites for the Sensors Directorate addition, waste storage facility, Vivarium, and entomology laboratory have been disturbed in the past for buildings, parking lots, roadways, underground utilities or other deep ground disturbing activities. Therefore, there is minimal, if any, potential for intact archaeological resources at these sites. WPAFB has concurrence with SHPO (see correspondence of February 29, 2008, in Appendix F).

Kittyhawk Community

The proposed site for the pipeline student dormitory has been disturbed in the past for buildings, parking lots, roadways, underground utilities or other deep ground disturbing activities. Therefore, there is minimal, if any, potential for intact archaeological resources at this site.

The Prairies

The proposed site for the Chapel Family Life Center addition has been disturbed in the past for buildings, parking lots, roadways, underground utilities or other deep ground disturbing activities. Therefore, there is minimal, if any, potential for intact archaeological resources at this site.

3.8 Air Quality

In accordance with the Clean Air Act (CAA), National Ambient Air Quality Standards (NAAQS) have been set by USEPA. The NAAQS are designed to limit pollution in the air anywhere in the United States in order to protect human health and public welfare. The NAAQS have been established for six criteria pollutants, which include sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter (PM), carbon monoxide (CO), ozone, and lead. Sections 107 and 110 of the CAA give the responsibility to each state for developing a set of regulations that implement the NAAQS, called state implementation plans (SIPs). Section 176(c) of the CAA requires that before a federal entity takes an action, it must make a determination that the Proposed Action will not interfere with the SIP or the state's ability to attain and maintain the NAAQS. The application of Section 176(c) is limited to nonattainment and maintenance areas only.

The Ohio EPA is responsible for developing the SIP and implementing and enforcing the environmental regulatory requirements outlined by USEPA, including monitoring for criteria pollutants to determine whether the levels meet the criteria pollutant attainment standards. WPAFB is located in the Dayton/Springfield area for ozone NAAQS, which covers Clark, Greene, Miami, and Montgomery counties. This area is considered in attainment for the 8-hour ozone standard. However, the Dayton/Springfield area (Clark, Montgomery, and Greene counties) is considered as basic nonattainment for particulate matter less than 2.5 microns in size (PM_{2.5}).

USEPA has established de minimis emissions levels and exempted certain actions. De minimis emissions levels are those levels below which no substantive impact to air quality would occur.

Actions which are expected to have emissions below these levels do not need to apply for a permit. USEPA has allowed federal entities to develop their own list of exempted actions, which are presumed to conform. For nonexempt actions that increase emissions above the de minimis levels, the federal agency must demonstrate that the action will conform with the SIP or will not cause or contribute to any new violation of any standard in any area; interfere with provisions in the applicable SIP for maintenance of any standard; increase the frequency or severity of any existing violation of any standard; or delay timely attainment of any standard or any required interim emissions reductions or other milestone.

USEPA is reviewing the general conformity program and may revise the regulations, as appropriate with respect to the 8-hour standard. USEPA is proposing to retain the existing de minimis emission levels for volatile organic compounds (VOCs) and NO_x (both ozone precursors). The existing de minimis emission levels do not include the “basic” nonattainment category. The de minimis emission levels for a “moderate” nonattainment area are 50 tons per year (tpy) for VOCs and 100 tpy for NO_x. The de minimis emission levels for an “other” nonattainment area are 100 tpy for VOCs and 100 tpy for NO_x. It has been assumed that the “moderate” category thresholds will be no more restrictive than the “basic” category threshold, and thus, the “moderate” category threshold has been used in this assessment.

WPAFB, which is considered a major source of air pollutants, submitted an application for a CAA Title V air quality operating permit in February 1996. Ohio EPA issued a final permit on January 27, 2004, with an effective date of February 17, 2004, identifying all sources of air pollution, applicable regulatory requirements, and emission limits. Planned construction activities (BRAC facilities and RFTS) have the potential to exceed existing limits in the Title V permit. See Section 4.8 for more information.

3.9 Noise

Noise can be defined as sound that is undesirable because it disrupts speech communication and hearing, is intense enough to damage hearing, or is otherwise irritating. When measuring sound to determine its effect on human population, A-weighted sound levels in decibels (dB) are typically used to account for the response of the human ear. A-weighted sound levels represent adjusted sound

levels according to a prescribed frequency response established by the American National Standards Institute (ANSI, 1983).

The Occupational Safety and Health Administration (OSHA) has established noise exposure standards in order to protect the hearing of employees. One such standard is designed to protect general industry employees, such as those working in the manufacturing, utilities, and service sectors (1910.95, *Occupational Noise Exposure*). OSHA standards for noise in the construction industry include 1926.52, *Occupational Noise Exposure*, and 1926.101, *Hearing Protection*. Other federal agencies and organizations have established similar criteria. The American Conference of Governmental Industrial Hygienists (ACGIH) has established exposure guidelines for occupational exposure to noise in its threshold limit values, and the National Institute for Occupational Safety and Health (NIOSH) recommends following noise exposure criteria established in the Criteria for a Recommended Standard: Occupational Noise Exposure—Revised Criteria, Publication No. 98-126 (NIOSH, 1998).

To address both noise and safety, the DoD requires military departments to establish an Air Installation Compatible Use Zone (AICUZ) program. The goal of AICUZ is to promote compatible land use on and off base to minimize noise complaints and safety hazards. Noise generated by aircraft approaching and leaving the main runway at Patterson Field (Area C) has been modeled based on the type and number of aircraft, and is expressed as the average day-night noise level in dB. The day-night noise level is mapped as contours in increments of 5 dB, radiating from the main airfield. The airfield near the museum in Area B is so infrequently used that it is not included in the model. These aircraft noise levels represent existing conditions to which potential noise levels from construction can be compared.

Prime BEEF Training Area

According to the AICUZ study, the PBTA project area is located in the current operations noise contours of 65 to 70 dB and 70 to 75 dB (WPAFB, 1995). Under a maximum mission noise scenario, the project area is located in the 70 to 75 dB and 75 to 80 dB contours (Figure 12). Typical noise sources in and around the area include human activities and aircraft.

Area B

According to the AICUZ study, the Hilltop District project areas are located in the current operations noise contours of less than 65 dB (add/alter Facility 20620, Sensors Directorate; Facility 20838, Vivarium; and the waste storage facility) and 65 to 70 dB (the entomology site) (WPAFB, 1995). Under a maximum mission noise scenario, the project areas are located in the 65 to 70 dB (add/alter Facility 20620, Sensors Directorate; Facility 20838, Vivarium; and the waste storage facility) and 70 to 75 dB (the entomology site) contours (Figure 13). Typical noise sources in and around the area include human activities and aircraft.

Kittyhawk Community

According to the AICUZ study, the proposed pipeline student dormitory is located in the current operations noise contours of less than 65 dB noise zone (WPAFB, 1995). Under a maximum mission noise scenario, the project area remains in the less than 65 dB contours.

The Prairies

According to the AICUZ study, the Chapel Family Life Center (Facility 20229) is located in the current operations noise contour of less than 65 dB noise zone (WPAFB, 1995). Under a maximum mission noise scenario, the project area remains in the less than 65 dB contours.

3.10 Health and Safety

There are four major categories of health and safety issues associated with Proposed Actions: worker safety and public safety during construction activities, plane flight paths within the base, potential exposure to chemical contamination present in various medium such as soil and groundwater, and explosive safety zones.

3.10.1 Construction Activities

Worker safety concerns during construction activities would primarily include hazards associated with physical hazards (for example, heavy equipment and vehicles, and power tools), underground utilities, and potential HAZMAT (for example, fuels). The construction crews would be responsible for adhering to applicable health and safety regulations. Physical hazards would include typical construction slips/trips/falls, hazards due to heavy and light on-site equipment usage, and vehicle accidents. Workers could potentially be exposed to chemicals associated with construction

equipment (for example, fuels, vehicle exhaust, welding fumes) or building materials (for example, paints, insulation). As discussed in Section 3.8, particulate matter would be generated during site preparation (that is, demolition of parking lot), excavation, and construction activities.

3.10.2 *Plane Flight Paths*

The USAF AICUZ program is intended to reduce the potential for aircraft mishaps in populated areas. As a result of this program, WPAFB has altered basic flight patterns to avoid heavily populated areas. In addition, airfield safety zones were established under AICUZ to minimize the number of people who would be injured or killed if an aircraft crashed. Three safety zones are designated at the end of all active runways: Clear Zone, Accident Potential Zone (APZ) I, and APZ II. The Clear Zone represents the most hazardous area. Although administrative uses (industrial, business services, manufacturing) are permitted in the APZs, “people-intensive” uses (for example, auditoriums, classrooms) are discouraged in these areas. According to AFI 32-7063, all new construction is required to comply with the AICUZ. The locations of the Proposed Actions are located outside all APZs at WPAFB.

3.10.3 *Environmental Contamination*

At the base, environmental contamination may have resulted from past operations and waste disposal practices. Contaminants may be present in media such soil and groundwater. As discussed in Section 3.4.3, DoD developed the IRP to identify, assess, and control potential environmental contamination. The proposed locations of the RFTS and waste storage facility are partially or entirely located within an IRP site. The entomology site is located along the edge of an AOC that is investigated as part of the IRP. Additional information on these sites was provided in Section 3.4.3.

3.10.4 *Explosive Safety Zones*

An explosive safety zone (referred to as a Q/D zone) is located within the PBTA. This Q/D zone designates an area in which explosive material is used. The boundary of the Q/D zone is the minimum distance required to protect non-explosive related facilities and personnel. At the PBTA, the Q/D arc defines an area within which training pyrotechnics (such as ground burst simulators) may be used. The 88 ABW/SE (Safety) established this “zone” to ensure that all PBTA users know

where such training activities are allowed and to apply the appropriate safety protocols while in this area.

3.11 Socioeconomics

WPAFB is the largest employer in the region. WPAFB has a work force numbering approximately 20,000 people, and employs nearly 1 in 12 people in the greater Dayton area. Approximately 92 percent of WPAFB's military and civilian employees live in the Dayton-Springfield Ohio Metropolitan Statistical Area (MSA) that includes Greene, Montgomery, Clark, and Miami counties. It is the fifth largest employer in the state of Ohio and the largest employer at a single location. The base has an annual payroll of approximately \$1.25 billion. Annual expenditures by WPAFB, including services, equipment, materials, and supplies, total about \$1.35 billion. The value of secondary jobs created is estimated to be \$750 million, for a total economic impact of the base in the regional economy of \$3.4 billion. In 2005, approximately \$1.6 million of educational impact aid funds were distributed to five local school districts that serve children of active military and civilian employees (WPAFB, 2006a).

Statistics provided by the Ohio Department of Development and Federal Census Bureau indicate that the percent of the population below poverty level in 2000 in Ohio and the three-county area was lower than the national average. On the other hand, in 2004, per capita income in Ohio and in the four-county area was below the national average. Since 2002, Ohio's unemployment rate also has been consistently higher than the national rate. There is speculation that this drop is largely a result of the loss of manufacturing jobs throughout the state over the last few years (Policy Matters Ohio, 2007). In general, Montgomery and Clark counties' poverty and unemployment rates are higher than the state average, while Greene County is lower than the state average (Table 4).

TABLE 4
Regional Economic Profile

| | Average per Capita Income (2004) | Percent below Poverty Level (2000) | Percent Unemployment | | | | |
|---------------|-------------------------------------|---------------------------------------|----------------------|------|------|------|------|
| | | | 2002 | 2003 | 2004 | 2005 | 2006 |
| Greene | \$32,497 | 8.5 | 5.0 | 5.4 | 5.5 | 5.5 | 5.0 |
| Montgomery | \$31,773 | 11.3 | 6.0 | 6.5 | 6.6 | 6.4 | 5.9 |
| Clark | \$28,094 | 10.6 | 7.0 | 7.3 | 6.7 | 6.4 | 5.7 |
| Miami | \$30,411 | 6.7 | 5.6 | 5.9 | 5.7 | 5.6 | 5.7 |
| Ohio | \$31,161 | 10.6 | 5.7 | 6.2 | 6.2 | 5.9 | 5.4 |
| United States | \$33,050 | 12.4 | 5.8 | 6.0 | 5.5 | 5.1 | 4.3 |

Population growth statistics for the four-county area are provided in Table 5. Greene and Miami counties show a slight increase in population, while Montgomery and Clark counties show a slight decrease in population. The estimated percent of vacant housing in 2004 for Greene, Montgomery, Clark, and Miami counties was 5.0 percent, 7.7 percent, 7.2 percent, and 5.2 percent, respectively (ODOD, 2006).

TABLE 5
Area Population Growth Statistics

| County | Total Population for 2000 ^a | Estimated Population for 2004 ^b | Percent Change in Population |
|------------|-------------------------------------------|-----------------------------------------------|------------------------------|
| Greene | 147,886 | 152,233 | 2.9% increase |
| Montgomery | 559,062 | 550,063 | 1.6% decrease |
| Clark | 144,742 | 142,613 | 1.5% decrease |
| Miami | 98,868 | 100,797 | 1.9% increase |

^a U.S. Census Bureau (2000)

^b Ohio Department of Development (2006)

3.12 Transportation/Traffic

Prime BEEF Training Area (Area C)

The PBTA is accessible from SR 444 by way of Communications Boulevard, to Battle Creek Road, to Hebble Creek Road, to Marl Road. Access to these roadways is unrestricted, to allow public access to the HPFF National Historic Landmark. Hebble Creek Road also is accessible directly from

Skeel Avenue in Area C through an unmanned gate that is typically closed. The PBTA is fenced; vehicle access is afforded by a lane and locked gate at the western terminus of Marl Road.

Area B

A substantial volume of commuter traffic accesses Area B daily. According to recent traffic counts and analysis in and around Area B, the average daily traffic into and out of Area B is roughly 16,500 vehicles (KZF/BWSC, 2007b). The morning peak hour traffic is the greatest, with 3,666 vehicles entering Area B.

Traffic enters and exits Area B by way of three gates: Gate 22B, which links to SR 444 and to Interstate 675 (I-675); Gate 1B to Springfield Street; and Gate 19B to National Road. Gate 1B and 22B are open continuously, while Gate 19B is only open during the morning and evening peak traffic hours. Generally, drivers enter at the gate nearest their destination.

Gates 1B and 22B are updated designs with sufficient capacity to accommodate the queuing of inbound vehicles caused by security checks. As part of the BRAC Infrastructure Upgrade Project, Gate 19B is programmed to be modernized and moved south along National Road to the Reese Drive intersection in early 2008. The new gate access road will connect to 8th Street at Hobson Way. The reconstruction of this gate is intended to accommodate the additional incoming traffic to Area B from the BRAC 2005 missions, including the proposed Sensors Directorate expansion, proposed AFIT expansion, and the proposed ITC campus, and to improve connections from the gate to the primary roadways in Area B.

In addition to the relocation of Gate 19B to align with 8th Street, the BRAC Infrastructure Upgrade Project also will include improvements to several main thoroughfares in the Hilltop Area. These improvements include widening Hobson Way from 5th Street to 10th Street, widening 8th Street from Hobson Way to Skyline Drive, widening 10th Street west of Hobson Way, and adding signals at the intersections of Hobson/8th Street and Hobson/13th Street. Pavement improvements along other, primary roadways in the Hilltop Area also are planned.

Facility 20838 (Vivarium) is accessible from Q Street. The Facility 20620 (Sensors Directorate) is directly accessible from 13th Street and Avionics Circle, which rings the parking lots that surround

the facility. The waste storage facility also is accessible from 13th Street. The entomology site is accessible from 12th Street, which ends about 250 feet east of G Street.

Kittyhawk Community

Gate 38C provides access to the Kittyhawk area from SR 444. Just prior to closing a second gate, Gate 39C, in 2006, 24-hour counts of incoming traffic were taken at each gate. The estimated weekday average daily traffic (ADT) for these gates were 8,022 and 4,474, respectively (double the counted incoming traffic), for a total ADT of approximately 12,500. There are currently no level of service (LOS) issues on roadways within the Kittyhawk area. SR 444 has an estimated ADT of 14,600 in the area of Kittyhawk (MVRPC, 2003b). It is designated by the Ohio Department of Transportation as an urban principal arterial.

The Miami Valley Regional Planning Commission's Transportation Improvement Program (TIP) for 2008-2011 (MVRPC, 2007) indicates no improvement projects are programmed for SR 444 in the Kittyhawk area over the next few years.

The Prairies

Access to the Prairies area is unrestricted from Spinning Road. Spinning Road is a two-lane, collector road that serves the Prairies and other single-family residential areas between Colonel Glenn Highway (aka Airway Road) (urban principal arterial) to the north and Burkhardt Road (minor arterial) to the south. Traffic counts in 2003 show Spinning Road carries an ADT of approximately 6,500 vehicles (MVRPC, 2003a). Airway Road carries approximately 18,500 and Burkhardt Road approximately 7,800.

The MVRPC TIP shows no planned improvements along Spinning Road or nearby sections of Burkhardt Road or Colonel Glenn Highway.

3.12.1 *Parking*

Prime BEEF Training Area (Area C)

Parking is adequate in the project area for the existing uses. Parking for occasional use of the area is provided by existing gravel lots within the developed area of the site.

Area B

Parking is provided in a number of surface lots generally close to the buildings they serve. In the areas of the proposed projects:

- Parking lots surround the Sensors Directorate, Facility 20620.
- Several parking areas are provided near the cluster of Facilities 20837, 20838 (proposed Vivarium addition), 20824, and 20441.
- A small parking area is provided at Facility 20479 (waste storage facility) for loading and unloading.
- Parking lots are present near Facility 20079, but they are dedicated to a proposed future use of this building. There are no parking lots at the entomology site. The only improvement at the proposed entomology site is a gravel lane that extends several hundred feet east from the end of 12th Street.

Kittyhawk Community

In the Kittyhawk Community Center, parking lots are located near the existing facilities. These lots provide ample parking area for these facilities.

The Prairies

In the Prairies project area, parking is provided in several lots between Chapel Lane and Phantom Drive, including adjacent to the Chapel Family Life Center (Facility 20229). These lots also provide parking for the nearby swimming pool and sports fields. Given the transitory nature of events at each of these facilities, these lots currently provide adequate parking spaces for these shared uses.

3.13 Utilities

3.13.1 Steam Heating

Heat is provided to most permanently occupied facilities in Areas A, B and C from a centralized steam system. Two coal-fired steam generating plants, one in Area B and the other in the Kittyhawk Community Center, supply steam heat to the facilities by way of underground and aboveground steam pipes.

Prime BEEF Training Area (Area C)

As a training area with transitory use, there are no steam heating supply lines to this area.

Area B

Three coal-fired boilers at Building 770 provide the majority of the heat for Area B facilities. The heat is supplied as steam distributed through a network of aboveground and belowground pipelines. Each coal-fired boiler can generate 120,000 pounds per hour (lb/hr) of steam. Currently, loads typically peak near 220,000 lb/hr on cold days, meaning that continuous firing of two boilers is adequate to handle the load, and the third boiler is kept in reserve. The plant also contains two natural gas-fired backup boilers that can each produce 80,000 lb/hr.

From Building 770, the steam pipeline passes south through a tunnel beneath Kauffman Avenue and emerges above ground south of 1st Street. Here, the steam is distributed by an “A” line and a “B” line. The “J” cross-tie line connects the “B” line to the “A” line north of 10th Street to create a loop and balance the pressure in the system. Combined, the “A” and “B” lines have the capacity to carry all of the steam generated by the coal-fired boilers. Steam lines serve most of the facilities in Area B, including Facility 20838 (the Vivarium), the Sensors Directorate Facility 20620, the existing hazardous waste storage facility (20479), and Facility 20079 (near the proposed entomology site).

An assessment of the steam heating system in Area B for the BRAC Infrastructure Upgrade Project shows that the existing boiler system has the capacity to supply the existing facilities, plus the proposed BRAC, AFIT and Information Technology Center (ITC) facilities. Some line upgrades and replacements (aboveground to underground) are programmed for 2008 to accommodate the proposed BRAC HPW complex.

Kittyhawk Community

Building 31240, located at the south end of the Kittyhawk Community Center, contains coal-fired boilers with gas-fired backup boilers. Steam heat is supplied by underground lines to buildings in the project area and to other buildings in Areas A and C. The boilers and heat distribution lines are similar to those in Area B, described above. The assessment of this system for the BRAC indicates that the boilers have adequate capacity for the proposed facilities in the Kittyhawk area.

The Prairies

Separated by a major thoroughfare from the rest of WPAFB, there are no steam heating supply lines to the Prairies area. The Prairies facilities are supplied heat from individual gas heating plants in each building.

3.13.2 Water

Groundwater from the Mad River buried valley aquifer is the main source of water at WPAFB and surrounding communities. The Mad River buried valley aquifer is part of the larger Miami Valley buried aquifer that serves much of southwestern Ohio (see also Section 3.3.1, Groundwater). The Miami Valley buried aquifer has been designated a sole source aquifer by USEPA, meaning it is the primary water supply for a significant portion of the population in the region. The Sole Source Aquifer Protection Program is authorized by Section 1424(e) of the Safe Drinking Water Act of 1974 (Public Law 93-523, 42 U.S. Code [USC] 300 et seq.). Federally funded projects that have the potential to contaminate the designated sole source aquifer are subject to USEPA review.

The City of Dayton's Mad River wellfield, located along the Mad River northwest of Area B, and the City of Fairborn's wellfield, northeast of Area C, are two of several community wellfields that withdraw drinking water from the Mad River aquifer. Wellhead protection zones have been established around each city's wellfield, and endorsed by the Ohio EPA, within which preventing, detecting, and remediating groundwater contamination is of greatest importance to protect the public water supply. Portions of the cities' wellfield protection areas overlap the base. WPAFB has entered into a memorandum of understanding with the City of Fairborn and the City of Dayton to protect the wellfields, which requires WPAFB to coordinate with these cities for construction projects within the wellhead protection zones. None of the project areas are located within the Dayton or Fairborn wellfield protection zones.

All of WPAFB is supplied water from WPAFB-owned and operated wells, except the Prairies, which is supplied water from the Montgomery County Sanitary Engineering Department. These wells are located in Areas A, B, and C and obtain water from the Mad River buried valley aquifer. Six community wells supply water for Areas A and C, and four wells supply Area B. There are six inactive wells located in Area C northeast of the PBTA that could be used as a backup supply for

Wright Field, if needed. Twin Base Golf Course uses non-potable water from one of these inactive wells for irrigation. Similar to municipal wellfield protection zones mentioned above, 1-, 5-, and 10-year contributing recharge areas have been delineated for on-base wellfields to identify areas most sensitive to potential contamination.

Prime BEEF Training Area (Area C)

Non-potable water is supplied by a line from the nearby wellfield northeast of the PBTA. Potable water is brought in by truck as required for each exercise in the area. This site is not located within any wellfield recharge or protection zones.

Area B

Water in Area B is supplied by the wells located north of 1st Street, and is treated and stored in three 300,000-gallon, ground-level reservoirs near Facility 20085A. The current estimated production and treatment capacity of the water system in Area B is 4,000 gallons per minute (gpm), or about 5.7 million gallons per day (mgd), which is well in excess of the current usage of 1.6 mgd.

Existing water lines extend to all proposed project areas. System upgrades are programmed for 2008 as part of the BRAC Infrastructure Upgrade Project. These upgrades include rerouting some water mains for the HPW facilities and the proposed Vivarium addition at Facility 20838.

The proposed project sites are not located within any wellfield recharge or designated protection zones.

Kittyhawk Community

Water for the Kittyhawk area is supplied from wells in Area C. None of the pipeline student dormitory project area is located within a wellfield recharge area.

The Prairies

Water to the Prairies area is supplied from the Montgomery County Sanitary Engineering Department. This site is not located within any wellfield recharge or designated protection zones.

3.13.3 Wastewater Collection

The majority of WPAFB's wastewater collection system, including all of the proposed BRAC project sites, discharges to the City of Dayton Wastewater Treatment Plant (WWTP). In general, the WPAFB wastewater collection system is designed for a population that is 50 percent larger than the current base population.

Prime BEEF Training Area (Area C)

There is a 24-inch diameter wastewater collection main that parallels SR 444 to the north, with existing manholes just south of the PBTA. Currently, there is no connection to this system from PBTA. Wastewater from portable toilets and showers at the PBTA is collected and removed periodically by a contractor to a treatment facility.

Area B

Area B is served by an extensive wastewater collection system. The system is divided into an "L" system, which collects wastewater from the eastern portion of Area B, and an "M" system that collects the western portion. The "M" system serves the downtown area, and therefore a greater proportion of the existing facilities in Area B.

A detailed evaluation of the utility infrastructure in Area B was recently performed as part of the BRAC Infrastructure Update/Human Performance Wing Facility Project (KZF/BWSC, 2006). This evaluation determined the current loading capacity and estimated the additional capacity needed for the BRAC 2005 missions that are being relocated to Area B, including the projects in this EA, plus the proposed AFIT and ITC complexes. The study identified a few section upgrades and some relocations that are needed for the new facilities, including relocating a line at the proposed site of the Vivarium and replacing sanitary sewer lines near the Sensors Directorate area along Hobson Way between 10th and 13th streets. Otherwise, the system was found to have adequate capacity for the BRAC and other proposed facilities. The BRAC Infrastructure Upgrade Project is programmed to begin construction in 2008 (KZF/BWSC, 2007b).

Based on monitoring by the City of Dayton WWTP and modeling of the system for the BRAC assessment, the estimated total wastewater volume from Area B is about 770,000 gallons per day (gpd). The proposed BRAC missions are expected to generate an estimated 600,000 gpd of

additional wastewater. The analysis showed that the City of Dayton WWTP has more than sufficient capacity for the additional flow expected.

Kittyhawk Community

Wastewater collection lines serve all of the existing facilities in the Kittyhawk area. In the area of the proposed pipeline student dormitory, an 8-inch-diameter main currently runs east-west through the middle of the project area, serving facilities to the east. Like Area B, wastewater from the Kittyhawk area is routed to the Dayton WWTP.

The Prairies

Wastewater collection at the Prairies is separate from the rest of WPAFB, but also is routed to the Dayton WWTP.

3.13.4 *Natural Gas*

Natural gas is used for auxiliary heating and various other minor services. Vectren Corporation supplies natural gas to WPAFB by way of several medium-pressure gas connections. According the analysis performed for the BRAC Infrastructure Upgrade Project, there is ample gas supply for all existing and proposed facilities at WPAFB.

Prime BEEF Training Area (Area C)

There is no natural gas service at the PBTA.

Area B

A network of natural gas mains supplies many facilities in Area B for auxiliary heating, including Facilities 20838 (Vivarium) and 20620 (Sensors Directorate). The hazardous waste storage facility (20479) and Facility 20079 (near the entomology site) currently do not have natural gas supply lines.

Kittyhawk Community

Natural gas distribution lines supply the existing facilities in the Kittyhawk project area.

The Prairies

Natural gas distribution lines supply most of the existing facilities in the Prairies area, although Facility 20229 does not currently have natural gas service.

3.13.5 *Electrical*

WPAFB receives electricity from the Dayton Power and Light Company by way of a substation located near the interchange of SR 844 and I-675. From that point, the power is stepped down at eight, interconnected substations around the base. From these substations, underground cables supply most of the power to facilities.

In general, electrical power supply at WPAFB has been sufficient and reliable. According to the WPAFB master plan (Woolpert, 2000), the system is designed for a much greater base population, and therefore the available service is more than adequate for the existing facilities.

Prime BEEF Training Area (Area C)

As a somewhat remote area, electrical power is supplied by overhead lines north of Hebble Creek Road from the main cantonment area of Area C. Generally, this area requires only moderate electrical capacity for lights and power at the existing buildings.

Area B

Overhead high tension lines from the main substation supply power to six substations at Area B. From these substations, underground duct banks supply electrical power to most existing facilities, including 20260 (Sensors Directorate), 20838 (Vivarium), 20479 (waste storage facility), and 20079 (near the entomology site). Underground electrical lines remain in place that formerly served Facilities 20079A-20079D (demolished in 2001), in the area of the proposed entomology site.

Some improvements are programmed in the BRAC Infrastructure Upgrade Project to accommodate the electrical requirements of the proposed HPW and other BRAC missions. Modifications include removal of some overhead electrical lines, and replacement with underground ducts. New duct lines will be added in the area of the proposed Vivarium. Two new pad-mounted transformers also will be installed to serve the new facilities.

Kittyhawk Community

Underground electrical duct banks supply energy to the existing facilities in the Kittyhawk area.

The Prairies

Underground electrical duct banks supply energy to the existing facilities in the Prairies project area.

3.13.6 Communications

Main communications lines run to “cable huts” and from there, communication connections are distributed to individual facilities. Existing communications lines serve all of the proposed project sites.

3.14 Environmental Justice

The purpose of EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, is to identify, address, and avoid disproportionately high and adverse human health or environmental effects on minority and low-income populations.

The Census 2000 information was referenced to identify potential Environmental Justice populations in the project areas (<http://www.census.gov/main/www/cen2000.html>). For Greene County as a whole, minority populations comprise 11.6 percent of the population; in Montgomery County, the proportion of minority populations is 24.2 percent. These statistics are summarized in Table 6.

TABLE 6
Minority and Low Income Populations for Greene, Montgomery, Clark, and Miami Counties, Ohio, Census 2000

| Race/Ethnicity | Greene County | Montgomery County | Clark County | Miami County |
|---------------------------------------------------------------------|---------------|-------------------|--------------|--------------|
| White | 89.2% | 76.6% | 88.1% | 95.8% |
| Black or African American | 6.4% | 19.9% | 8.9% | 2.0% |
| American Indian and Alaska Native | 0.3% | 0.2% | 0.3% | 0.2% |
| Asian | 2% | 1.3% | 0.5% | 0.8% |
| Native Hawaiian and other Pacific Islander | 0.0% | 0.0% | 0.0% | 0.0% |
| Hispanic or Latino ^a | 1.2% | 1.3% | 1.2% | 0.7% |
| Other | 0.4% | 0.5% | 0.5% | 0.3% |
| Total Minority Populations | 11.6% | 23.2% | 11.4% | 4.6% |
| Proportion of Population with Income Below the Poverty Level | 8.5% | 11.3% | 10.6% | 6.7% |

Source: US Census Bureau 2000

^a Persons of Hispanic or Latino origin may be of any race; because of this, the sum of the percentages does not equal 100.

The block groups that include the Prairies and the rest of WPAFB have higher than average minority populations. The block group east of Area B, around Wright State University, also has a higher than

average minority population. A number of block groups to both the east and west of WPAFB have a higher than average ratio of low income populations.

4 Potential Environmental Impacts

4.1 Introduction

The purpose of this chapter is to provide an evaluation of the potential impacts associated with the Proposed Actions, namely the construction of the proposed facilities and infrastructure at the RFTS. The No Action Alternative represents the baseline conditions to which the Proposed Actions are compared. The impacts of the Proposed Action are summarized in Table 3.

4.2 Natural Resources

4.2.1 Vegetation

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

The vegetation in the area of the proposed gravel pads for tents will be disturbed and removed. The vast majority of this impact would be to maintained grass areas, which do not represent unique or high quality vegetative communities.

Minor clearing of ordinary shrubby vegetation, consisting of invasive species such as honeysuckle and autumn olive, will be necessary at some woodland edges for the tent pad. Minor removal of shrubby growth will also be necessary where utility lines will be upgraded or installed, such as the proposed wastewater line along the edge of the gravel lane. No removal of larger trees will be necessary. No unique or high quality vegetative communities would be affected.

Add/Alter Facility 20620 (Proposed Action)

Vegetation in the proposed project area would be disturbed and removed during site preparation. The vegetation the project area is planted and maintained grass, with occasional landscaped trees and shrubs, and does not represent unique or high quality vegetative communities. Areas that are temporarily disturbed around the proposed building site, such as for utility connections, would be restored to a similar condition after construction activities are complete.

Expansion of Facility 20838 (Proposed Action)

Vegetation throughout the proposed project area would be disturbed and removed during site preparation. The vegetation in the area of the proposed addition to Facility 20838 is mowed lawn. This vegetation does not represent a unique or high quality vegetative community. Where possible,

temporarily disturbed areas around the building site would be restored to a similar condition after construction activities are complete.

Construct Entomology Site (Proposed Action)

Vegetation throughout the proposed project area would be disturbed and removed during site preparation. Impacts to vegetation in most of the project area would be to maintained grass. Some of this project site, which was previously developed, has been allowed to naturally regrow with ordinary brush and sapling trees. Minor clearing of some of this brush will be required in limited areas. This clearing will not affect any unique or high quality vegetative community. Areas that are temporarily disturbed areas around proposed pavement and building site, such as for utility connections, would be restored with similar vegetation species (for example, grasses) after construction activities are complete.

Construct Waste Storage Facility (Proposed Action)

Vegetation in the area of the proposed waste storage facility is mowed lawn with occasional planted landscape shrubs and small trees. This vegetation does not represent a unique or high quality vegetative community. Where possible, temporarily disturbed areas around the building site would be restored to a similar condition after construction activities are complete.

Construct Pipeline Student Dormitory (Proposed Action)

Vegetation in the area of the proposed pipeline student dormitory is mowed lawn with occasional planted landscape shrubs and small trees. This vegetation does not represent a unique or high quality vegetative community. Where possible, temporarily disturbed areas around the building site would be restored to a similar condition after construction activities are complete.

Expand Chapel Family Life Center (Proposed Action)

The vegetation in the area of the proposed addition to Facility 20229 is mowed lawn, which would be disturbed and removed during site preparation. This vegetation does not represent a unique or high quality vegetative community. Where possible, temporarily disturbed areas around the building site would be restored to a similar condition after construction activities are complete.

No Action

The No Action Alternatives would have no impact on vegetation.

4.2.2 Wildlife

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

The wildlife habitat that would be affected by the majority of the Proposed Action is comprised of maintained grassy areas that are at least occasionally mowed. These areas would be expected to have low wildlife habitat value.

Add/Alter Facility 20620 (Proposed Action)

This project is located in a developed area. The vegetation that would be affected by the Proposed Action is comprised of maintained grassy areas that are frequently mowed surrounding the existing facility and parking lots. These areas typically have limited wildlife habitat value. Therefore, this project is expected to have minimal impact on wildlife.

Expansion of Facility 20838 (Proposed Action)

The vegetation that would be affected by the Proposed Action is comprised of a small area of maintained lawn between the existing building and parking lots. This area has low wildlife habitat value. Therefore, this project is expected to have minimal impact on wildlife.

Construct Entomology Site (Proposed Action)

The wildlife habitat that would be affected by the majority of the Proposed Action is comprised of maintained grassy areas that are at least occasionally mowed. These areas would be expected to have low wildlife habitat value.

Construct Waste Storage Facility (Proposed Action)

This project is located in a developed area. The wildlife habitat that would be affected by the Proposed Action is comprised of maintained grassy areas that are frequently mowed with occasional planted trees and shrubs. These areas typically have limited wildlife habitat value. Therefore, this project is expected to have minimal impact on wildlife.

Construct Pipeline Student Dormitory (Proposed Action)

This project is located in a developed area. The vegetation that would be affected by the Proposed Action is comprised of maintained grassy areas that are frequently mowed. These areas would be expected to have low wildlife habitat value. Therefore, this project is expected to have minimal impact on wildlife.

Expand Chapel Family Life Center (Proposed Action)

This project is located in a developed area. The vegetation that would be affected by the Proposed Action is comprised of maintained grassy areas that are frequently mowed. These areas would be expected to have low wildlife habitat value. Therefore, this project is expected to have minimal impact on wildlife.

No Action

The No Action Alternatives would have no impact on wildlife.

4.2.3 *Threatened and Endangered Species*

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

The woodlands of the PBTA are considered to be of low to moderate quality as roosting habitat for the Indiana bat. Recent surveys for the bat found no roost trees in the PBTA, but the bats are known to forage in the area, particularly along Hebble Creek. A minor amount of invasive shrubby vegetation along the edges of the developed area will need to be removed for the Proposed Action. Generally, the dense shrubby undergrowth that would be removed is not preferred habitat for Indiana bat roosting or foraging. The Proposed Action will not remove any trees that are suitable as roosting habitats. No impacts will occur in woodlands along Hebble Creek.

Based on historical sightings, the INRMP considers the entire PBTA and the adjacent Twin Lakes Golf Course as primary habitat for the eastern massasauga. The most recent surveys (1999) near the PBTA for the snake found none. In 2008, WPAFB plans to conduct a survey of areas identified to be prime habitat for the eastern massasauga rattlesnake, including the PBTA.

Because the eastern massasauga rattlesnake is a federal candidate species, there is no requirement to survey construction areas for potential snake habitat. However, to protect massasaugas and their

habitat, WPAFB has restricted new development and other ground-disturbing activities within the PBTA. The base has adopted measures to minimize potential impact to the eastern massasauga habitat, which focus on this general area of the base. These measures include the following:

- Avoiding fragmenting suitable habitat.
- Avoiding impacts to wetlands
- Avoiding draining or reducing groundwater levels, particularly during winter.
- Limiting disturbance, including mowing, disking, or prescribed burning (prairie maintenance), to periods when snakes are less active, preferably before snakes become active in the spring or after activity has ceased in the fall.
- Training for all users of the PBTA to recognize the snake and, if encountered, to avoid the animal and contact the base Natural Resources Manager.

Impact to developed areas in the PBTA, such as gravel parking areas or roads, is not anticipated to have any effect on the snake or its potential habitat. The project would have no direct impact on nearby Wetland C18, a potential winter hibernacula; however, the snake could potentially occur in the open fields and woodlands near Wetland C18, where the project is proposed. In addition, WPAFB plans to conduct a survey of areas identified to be prime habitat for the eastern massasauga rattlesnake, including the PBTA in FY 2008.

To avoid impacts to the Indiana bat and the eastern massasauga, seasonal restrictions on development activities (such as clearing, grading, laying of gravel and utility line installation) will be enforced, so that they occur during periods when the Indiana bat and eastern massasauga are least likely to be present. Both of these species return to their hibernacula from late fall to spring. Prior to construction, the project designers shall notify all people that may be working on the project (including contractors, engineers, machine operators, etc.) that the eastern massasauga exists in the area, that the snake is poisonous and should not be handled, and that the snake is a protected species and should not be harmed or killed. The project site should be examined daily for snakes, and if any eastern massasaugas are found, all work shall cease and the natural resources manager shall be contacted immediately. Similar training to recognize and protect the snake will be given to all users of the PBTA. Further, all training will be restricted to the 20-acre disturbed area of the PBTA.

Provided these guidelines are followed, the project, as proposed is not likely to adversely affect the eastern massasauga or the Indiana bat.

The open field south of the PBTA main training area, near the existing wastewater line, is considered a potential habitat for the blazing star stem borer. Disturbance in this area will be restricted to installation of the proposed wastewater line along the edge of the existing gravel lane. Temporarily disturbed areas will be restored with a grass vegetation cover. Therefore, no impact to this habitat is anticipated from this action.

WPAFB has coordinated the Proposed Action and methods to minimize impact to these species with the USFWS, under Section 7 of the ESA. As part of this coordination, a USFWS representative visited the PBTA on November 27, 2007, and raised no concerns with the proposed action (K. Beason, 88 ABW/CEVO, personal communication). In a subsequent letter (December 27, 2007), the USFWS concurred that the Proposed Action is not likely to adversely affect any listed species (Appendix D). This letter concludes the Section 7 consultation for the project.

Add/Alter Facility 20620 (Proposed Action)

As a primarily mowed lawn habitat in a developed area, no threatened or endangered species have been identified or are likely to occur in the project area. Nearby woodlands that may provide suitable habitat for the Indiana bat, as shown in the INRMP, or the recorded habitat of the state listed pigeon grape, will not be affected by this project. Therefore, the Proposed Action will likely have no effect on any protected species.

WPAFB is coordinating the Proposed Action with USFWS to confirm this determination.

Expansion of Facility 20838 (Proposed Action)

As a primarily mowed lawn habitat in a developed area, no threatened or endangered species have been identified or are likely to occur in the project area. Therefore, the Proposed Action will likely have no effect on any protected species.

WPAFB is coordinating the Proposed Action with USFWS to confirm this determination.

Construct Entomology Site (Proposed Action)

The project area was previously developed, and is primarily comprised of mowed grass along an existing gravel lane. A limited amount of ordinary shrubby vegetation would also be removed along the perimeter of the project area. No threatened or endangered species have been identified or are likely to occur in the project area. Therefore, the Proposed Action will likely have no effect on any protected species.

WPAFB is coordinating the Proposed Action with USFWS to confirm this determination.

Construct Waste Storage Facility (Proposed Action)

As a primarily mowed lawn habitat in a developed area, no threatened or endangered species have been identified or are likely to occur in the project area. Nearby woodlands that may provide suitable habitat for the Indiana bat, or the recorded habitat of the state listed pigeon grape, will not be affected by this project. Therefore, the Proposed Action will likely have no effect on any protected species.

WPAFB is coordinating the Proposed Action with USFWS to confirm this determination.

Construct Pipeline Student Dormitory (Proposed Action)

As a primarily mowed lawn habitat in a developed area, no threatened or endangered species have been identified or are likely to occur in the project area. Therefore, the Proposed Action will likely have no effect on any protected species.

WPAFB is coordinating the Proposed Action with USFWS to confirm this determination.

Expand Chapel Family Life Center (Proposed Action)

As a primarily mowed lawn habitat in a developed area, no threatened or endangered species have been identified or are likely to occur in the project area. Therefore, the Proposed Action will likely have no effect on any protected species.

WPAFB is coordinating the Proposed Action with USFWS to confirm this determination.

No Action

The No Action Alternatives would have no impact on threatened or endangered species.

4.2.4 Wetlands

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

No wetlands would be directly impacted by the Proposed Action. However, the Proposed Action will include minor clearing of shrubby vegetation, minor grading, installation of utility lines, and laying of gravel pads within 50 feet of Wetland C18. To avoid inadvertent impact to the wetland, the limits of construction will be staked in the field in cooperation with the Natural Resources manager. Proper erosion and sedimentation controls will be implemented along the perimeter during construction (see Section 4.3.2).

The Proposed Action is not expected to alter the hydrology of the wetland, because only a single, small permanent structure will be installed. All of the travel and activity surfaces will be pervious (gravel) material, allowing precipitation to continue to penetrate to the groundwater table. Storm water runoff from the site would be minimally affected. During construction, engineering controls will be used to protect the wetlands, such as posting a sign identifying the wetland and cordoning off the area.

All training activities will be limited to the disturbed area outside of the wetlands.

Add/Alter Facility 20620 (Proposed Action)

No wetlands occur in or near the site, or would be affected by the Proposed Action.

Expansion of Facility 20838 (Proposed Action)

No wetlands occur in or near the site, or would be affected by the Proposed Action.

Construct Entomology Site (Proposed Action)

No wetlands occur in or near the site, or would be affected by the Proposed Action.

Construct Waste Storage Facility (Proposed Action)

No wetlands occur in or near the site, or would be affected by the Proposed Action.

Construct Pipeline Student Dormitory (Proposed Action)

No wetlands occur in or near the site, or would be affected by the Proposed Action.

Expand Chapel Family Life Center (Proposed Action)

No wetlands occur in or near the site, or would be affected by the Proposed Action.

No Action

The No Action Alternatives would have no impact on wetlands

4.3 Water Resources

4.3.1 Groundwater

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

Groundwater quality would not be impacted by the Proposed Action.

Add/Alter Facility 20620 (Proposed Action)

Groundwater quality would not be impacted by the Proposed Action.

Expansion of Facility 20838 (Proposed Action)

Groundwater quality would not be impacted by the Proposed Action.

Construct Entomology Site (Proposed Action)

Groundwater quality would not be impacted by the Proposed Action.

Construct Waste Storage Facility (Proposed Action)

Groundwater quality would not be impacted by the Proposed Action.

Construct Pipeline Student Dormitory (Proposed Action)

Groundwater quality would not be impacted by the Proposed Action.

Expand Chapel Family Life Center (Proposed Action)

Groundwater quality would not be impacted by the Proposed Action.

No Action

The No Action Alternatives would have no impact on groundwater.

4.3.2 Surface Water

At each of the proposed project sites, vegetation will be removed and soil would be disturbed and exposed to erosion. In accordance with the NPDES Storm Water Program administered by Ohio EPA, measures must be taken to prevent erosion and sediment export to surface waters. For any construction project that is disturbing more than 1 acre of land, a project-specific NOI must be filed by the contractor with the Ohio EPA prior to construction, under the Ohio General Construction Permit. A site-specific SWP3 that specifies the erosion control measures to be implemented must be filed with the NOI. WPAFB has developed standard specifications for erosion control on construction projects. Typically, soil erosion and siltation control measures include the use of silt fencing and/or hay bales along the perimeter of construction or at storm drain inlets, and/or hydro-mulching in and adjacent to construction areas.

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

Except for a few buildings and the mock runway surface, the majority of the PBTA remains pervious to precipitation. The Proposed Action is expected to minimally alter storm water runoff from the site. Only a single, small permanent structure will be installed. All of the proposed travel and activity surfaces will be pervious (gravel) material, allowing precipitation to continue to penetrate to the groundwater table. The project will occur near Wetland C18, but near no other surface waters.

Construction activities will cover more than 1 acre at the PBTA. Therefore, a site-specific SWP3 will be developed and filed with the NOI for construction at this site.

As the project will install little impervious surface, no storm water management features (such as detention basins) are proposed.

Add/Alter Facility 20620 (Proposed Action)

The construction of this project will occur near no surface waters. However, construction activities will likely cover more than 1 acre at Facility 20620. Therefore, a site-specific SWP3 will be developed and filed with the NOI for construction at this site. This plan will include specifications to prevent sediment erosion into the storm sewer.

As the project will install additional impervious surface, storm water management features may be necessary. The requirements for storm water management at the site will be determined as the project is developed, in accordance with the WPAFB NPDES permit.

Expansion of Facility 20838 (Proposed Action)

There are no surface waters near this site. Construction of the addition to Facility 20838 will likely involve less than 1 acre of land disturbance. Therefore, a site-specific SPW3 and NOI need not be filed with the Ohio EPA prior to construction. Nevertheless, erosion controls will be implemented in accordance with WPAFB standard specifications in order to prevent sedimentation to the existing storm sewer.

As a relatively small project, the proposed addition to Facility 20838 will add little impervious surface to the area. This project was included in the evaluation of storm water management needs for the HPW and the BRAC infrastructure project (KZF/BWSC, 2007). That project included development of an additional storm water detention basin in Area B north of First Street. Therefore, any storm water management requirements for this project are assumed to have been satisfied by the BRAC infrastructure project.

Construct Entomology Site (Proposed Action)

There are no surface waters near this site. Construction of the entomology site will likely involve less than 1 acre of land disturbance. Therefore, a site-specific SPW3 and NOI need not be filed with the Ohio EPA prior to construction. Nevertheless, erosion controls will be implemented in accordance with WPAFB standard specifications in order to prevent sedimentation to the existing storm sewer.

As a relatively small project, the proposed entomology site development will add little impervious surface to the area. The requirements for storm water management at the site will be determined as the project is developed, in accordance with the WPAFB NPDES permit.

Construct Waste Storage Facility (Proposed Action)

There are no surface waters near this site. Construction of the waste storage facility will likely involve less than 1 acre of land disturbance. Therefore, a site specific SPW3 and NOI need not be

filed with the Ohio EPA prior to construction. Nevertheless, erosion controls will be implemented in accordance with WPAFB standard specifications in order to prevent sedimentation to the existing storm sewer.

As a relatively small project, the proposed waste storage facility will add little impervious surface to the area. The requirements for storm water management at the site will be determined as the project is developed, in accordance with the WPAFB NPDES permit.

Construct Pipeline Student Dormitory (Proposed Action)

The construction of this project will occur near no surface waters. However, construction activities will likely cover more than 1 acre at Facility 20620. Therefore, a site-specific SWP3 will be developed and filed with the NOI for construction at this site. This plan will include specifications to prevent sediment erosion into the storm sewer.

As the project will install additional impervious surface, storm water management features may be necessary. The requirements for storm water management at the site will be determined as the project is developed, in accordance with the WPAFB NPDES permit.

Expand Chapel Family Life Center (Proposed Action)

There are no surface waters near this site. Construction of the addition to Facility 20229 will likely involve less than 1 acre of land disturbance. Therefore, a site-specific SPW3 and NOI need not be filed with the Ohio EPA prior to construction. Nevertheless, erosion controls will be implemented in accordance with WPAFB standard specifications in order to prevent sedimentation to the existing storm sewer.

As a relatively small project, the proposed addition to Facility 20229 will add little impervious surface to the area. The requirements for storm water management at the site will be determined as the project is developed, in accordance with the WPAFB NPDES permit.

No Action

The No Action Alternatives would have no impact on surface water.

4.3.3 Floodplain

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

The PBTA is located within the 100-year floodplain of the Huffman Retarding Basin. As a result, it may be subject to flooding as a result of the retarding action of the dam during high rainfall events.

The proposed improvements to the PBTA include installation of one small storage (uninhabited) structure, underground utilities, and gravel pads for tents and vehicles. Except for the storage building, these activities will have little or no effect on the ground elevation or storage capacity of the floodplain. Further, most of the proposed surface in the PBTA will be pervious (gravel) surfaces, thereby retaining the ability of flood waters and precipitation to percolate into the soils.

WPAFB has coordinated with the MCD to confirm that the project will not affect the floodplain storage capacity (letter of November 27, 2007, in Appendix E). MCD does not object to the proposed storage building, although they recommend that no hazardous materials or equipment susceptible to flooding should be stored there.

Add/Alter Facility 20620 (Proposed Action)

The Proposed Action is not located in the 100-year floodplain. The project would generate some additional storm water runoff; however, it would not take away or add to the existing flood storage capacity. Therefore, no short-term or long-term impacts to the floodplain are expected from the Proposed Action.

Expansion of Facility 20838 (Proposed Action)

The proposed addition to Facility 20838 is not located in the 100-year floodplain. The project would generate a minor amount of additional storm water runoff; however, it would not take away or add to the existing flood storage capacity. Therefore, no short-term or long-term impacts to the floodplain are expected from the Proposed Action.

Construct Entomology Site (Proposed Action)

The entomology site is not located in the 100-year floodplain. The project would generate additional storm water runoff; however, it would not take away or add to the existing flood storage capacity.

Therefore, no short-term or long-term impacts to the floodplain are expected from the Proposed Action.

Construct Waste Storage Facility (Proposed Action)

The waste storage facility site is not located in the 100-year floodplain. The project would generate a minor amount of additional storm water runoff; however, it would not take away or add to the existing flood storage capacity. Therefore, no short-term or long-term impacts to the floodplain are expected from the Proposed Action.

Construct Pipeline Student Dormitory (Proposed Action)

The pipeline student dormitory site is not located in the 100-year floodplain. The project would generate some additional storm water runoff; however, it would not take away or add to the existing flood storage capacity. Therefore, no short-term or long-term impacts to the floodplain are expected from the Proposed Action.

Expand Chapel Family Life Center (Proposed Action)

The proposed addition to Facility 20229 is not located in the 100-year floodplain. The project would generate minor additional storm water runoff; however, it would not take away or add to the existing flood storage capacity. Therefore, no short-term or long-term impacts to the floodplain are expected from the Proposed Action.

No Action

The No Action Alternatives would have no impact on floodplain management.

4.4 Hazardous Materials/Waste, Stored Fuels, and Installation Restoration Program

4.4.1 Hazardous Materials/Waste

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

During construction of the RFTS, all construction would conform to OSHA requirements such as described by the *OSHA Guidance Manual for Hazardous Waste Site Activities, Standard Operating Safety Guides* (USEPA, 1992) and *Safety and Health Regulations for Construction* (29 CFR 1926). Health and safety plans would be developed and would include environmental exposure monitoring.

Construction contractors would maintain compliance with all environmental regulations and permits that apply to the work being performed. Periodic environmental health and safety monitoring may be needed to verify that employees are protected and exposure limits are not exceeded. Each contractor would maintain an OSHA 200 log.

Pollution source reduction techniques and prevention strategies, as appropriate, recommended by USEPA's Office of Pollution Prevention, would be incorporated into the design of proposed projects. If unexpected conditions are encountered during construction, work would stop, and the appropriate environmental and health protection actions would be taken in accordance with project specifications. To mitigate for potential impacts associated with future construction and to protect human health and the environment, the following general actions would be performed:

- All materials (hazardous and nonhazardous) and wastes generated from construction activities would be handled, stored, and disposed in accordance with applicable federal, state, and local regulations.
- Strict contract specifications would be established for construction contractors requiring proper management and disposal of materials and waste.
- Waste generation would be minimized to the extent possible.
- Excavated soil would be used as fill material, as appropriate.
- Procedures, plans, and programs would be developed to prevent risk to workers and public health, which could result from exposure to HAZMAT, contaminated soil, and HW.
- Proper storage and containment structures would be provided for HAZMAT so that hazardous constituents are not released to the environment.
- Health and safety plans would be developed by all construction contractors to address potential hazards, including potentially contaminated soils, under the guidance of a recognized safety and health professional.
- Access to the construction sites would be controlled with security gates and fencing.

Wastes typically generated during construction include lumber, concrete, metal, glass, plastics, solvents, and empty containers. Local contractors would be required to comply with federal, state, and local requirements for waste classification, record keeping, reporting, and disposal. During

construction, contractors would be required to develop a Construction Management Plan that would include measures to be employed if drums or contaminated soil and groundwater were encountered, or required management or disposal. Stationary fuel tanks would have secondary containment and would be managed so that spills are prevented. HAZMAT containers would have proper labeling as required under OSHA's Hazard Communication Standard. Spill Prevention and Response Plans would be developed and implemented. Material safety data sheets would be available for review.

The construction contractor would be responsible for the proper identification, containerization, labeling, and storage of HAZMAT and regulated wastes generated during construction. HAZMAT and other regulated wastes generated by the construction contractor would be disposed by WPAFB. Handling and storage of HAZMAT would be performed in accordance with the manufacturer's specifications and WPAFB specifications. Asbestos is a regulated waste and will be disposed of by the contractor with WPAFB oversight. In general, it is anticipated that HAZMAT handled and wastes generated during operations at WPAFB would be minor and consistent with baseline conditions already occurring.

Add/Alter Facility 20620 (Proposed Action)

Any HAZMAT or HW generated during the construction or operation of the addition and altered spaces at Facility 20620 would be addressed as described under *Locate Remote Field Training Site at Prime BEEF Training Area*.

Expansion of Facility 20838 (Proposed Action)

Any HAZMAT or HW generated during the construction or operation of the Vivarium addition at Facility 20838 would be addressed as described under *Locate Remote Field Training Site at Prime BEEF Training Area*.

Construct Entomology Site (Proposed Action)

Any HAZMAT or HW generated during the construction or operation of the entomology site would be addressed as described under *Locate Remote Field Training Site at Prime BEEF Training Area*.

Construct Waste Storage Facility (Proposed Action)

Any HAZMAT or HW generated during the construction of the waste storage facility would be addressed as described under *Locate Remote Field Training Site at Prime BEEF Training Area*. This facility would only store universal, PCB, and non-RCRA wastes.

Construct Pipeline Student Dormitory (Proposed Action)

Any HAZMAT or HW generated during the construction of the pipeline student dormitory would be addressed as described under *Locate Remote Field Training Site at Prime BEEF Training Area*.

Expand Chapel Family Life Center (Proposed Action)

Any HAZMAT or HW generated during the construction of the Chapel Family Life Center would be addressed as described under *Locate Remote Field Training Site at Prime BEEF Training Area*.

No Action

The No Action Alternatives would have no impact on HAZMAT or HW.

4.4.2 *Stored Fuels*

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

At least one generator would be used at the RFTS. The associated generator fuel tank(s) would hold enough fuel for 24 hours of full operation. Once generator and fuel tank specifications have been provided to the base, determination of any applicable SPCC requirements will be made by the Environmental Management Division. All applicable regulatory standards will be reviewed to ensure that any regulatory requirements would be adhered to. When available, the specifications for the generator will be provided to the 88 ABW/CEVY Air Program Manager for a determination of air source Permit to Install (PTI) requirements.

Add/Alter Facility 20620 (Proposed Action)

No generators are associated with the Proposed Action.

Expansion of Facility 20838 (Proposed Action)

No generators are associated with the Proposed Action.

Construct Entomology Site (Proposed Action)

No generators are associated with the Proposed Action.

Construct Waste Storage Facility (Proposed Action)

No generators are associated with the Proposed Action.

Construct Pipeline Student Dormitory (Proposed Action)

No generators are associated with the Proposed Action.

Expand Chapel Family Life Center (Proposed Action)

No generators are associated with the Proposed Action.

No Action

The No Action Alternative would have no impact on stored fuels.

4.4.3 IRP Sites

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

One IRP site, FTA1, is located within the PBTA (Figure 12). According to information in the *Land Use Control Plan* (Shaw, 2006), digging, construction, and other soil disturbances are allowable within this IRP site after approval by Base Civil Engineering and Environmental Management Division personnel. Minor short-term impacts (that is, soil disturbance) could occur during placement of a utility line for the remote field training infrastructure. No long-term impacts would be expected.

Add/Alter Facility 20620 (Proposed Action)

No IRP sites are located within the projects area; therefore, no impacts would occur.

Expansion of Facility 20838 (Proposed Action)

No IRP sites are located within the projects area; therefore, no impacts would occur.

Construct Entomology Site (Proposed Action)

The proposed location of the entomology site is located on the western edge of the former Building 79A-D/95 complex AOC. No impacts to this AOC are anticipated; however, as described in Section

3.4.3, TCE and solvents have been detected in groundwater in the vicinity of this AOC. Therefore, precautions such as soil and groundwater sampling are recommended to ensure that chemical contamination is not present in the proposed location of the facility.

Construct Waste Storage Facility (Proposed Action)

One IRP site, EFDZ4, is located at the proposed location of the waste storage facility (Figure 13). According to information in the *Land Use Control Plan* (Shaw, 2006), digging, construction, and other soil disturbances are allowable within this IRP site after approval by Base Civil Engineering and Environmental Management Division personnel. Minor short-term impacts (that is, soil disturbance) could occur during placement of facility and associated utility tie-ins. No long-term impacts would be expected.

Construct Pipeline Student Dormitory (Proposed Action)

No IRP sites are located within the projects area; therefore, no impacts would occur.

Expand Chapel Family Life Center (Proposed Action)

No IRP sites are located within the projects area; therefore, no impacts would occur.

No Action

The No Action Alternative would have no impact on the IRP sites.

4.5 Land Use

4.5.1 Remote Field Training Site

Locate Remote Field Training Site at Prime BEEF Area (Proposed Action)

As stated in Section 3.5, current land use in the PBTA is classified as industrial and open space. The Proposed Action would have no impact on land use in the PBTA. RFTS activities would be conducted only in disturbed area at the site.

No Action

The No Action Alternative would have no impact on land use.

4.5.2 Sensors Directorate

Add/Alt Facility 20620

As stated in Section 3.5, current land use in the project area is classified as research and development. The Proposed Action would have no impact on land use.

No Action

The No Action Alternative would have no impact on land use.

4.5.3 Vivarium

Expansion of Facility 20838 (Proposed Action)

As stated in Section 3.5, current land use at Facility 20838 is classified as research and development. The Proposed Action would have no impact on land use.

No Action

The No Action Alternative would have no impact on land use.

4.5.4 Entomology Site

Construct Entomology Site in Area B

As stated in Section 3.5, current land use in at the proposed location of the entomology site is classified as research and development. The Proposed Action would have no impact on land use.

No Action

The No Action Alternative would have no impact on land use.

4.5.5 Waste Storage Facility

Construct New Waste Storage Facility (Proposed Action)

As stated in Section 3.5, current land use in at the proposed location of the waste storage facility is classified as open space. Once the facility was built, the land use would change to industrial. This change in land use is consistent with land use plans outlined in the WPAFB General Plan (Woolpert, 2001); therefore, no negative impact is associated with a change in land use designation in this area of the base.

No Action

The No Action Alternative would have no impact on land use.

4.5.6 Pipeline Student Dormitory

Construct New Pipeline Student Dormitory in Kittyhawk Community (Proposed Action)

As stated in Section 3.5, current land use in at the proposed location of the pipeline student dormitory is classified as open space. Once the dormitory was built, land use designated would change to housing unaccompanied. This change in land use is consistent with land use plans outlined in the WPAFB General Plan (Woolpert, 2001); therefore, no negative impact is associated with a change in land use designation in this area of the base.

No Action

The No Action Alternative would have no impact on land use.

4.5.7 Religious Education Center

Expand Facility 20229 (Proposed Action)

As stated in Section 3.5, current land use in at the Chapel Family Life Center is classified as community service. Expansion of this facility would have no impact on land use.

No Action

The No Action Alternative would have no impact on land use.

4.6 Soil

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

Limited soil disturbance is expected under the Proposed Action. As a result of the construction activities, there would be a potential short-term minor impact to soil during site preparation and excavation activities. Impacts would be minimized through implementation of erosion and siltation controls.

Add/Alter Facility 20620 (Proposed Action)

Limited soil disturbance is expected under the Proposed Action. As a result of the construction activities, there would be a potential short-term minor impact to soil during site preparation and

excavation activities. Impacts would be minimized through implementation of erosion and siltation controls.

Expansion of Facility 20838 (Proposed Action)

Limited soil disturbance is expected under the Proposed Action. As a result of the construction activities, there would be a potential short-term minor impact to soil during site preparation and excavation activities. Impacts would be minimized through implementation of erosion and siltation controls.

Construct Entomology Site (Proposed Action)

Limited soil disturbance is expected under the Proposed Action. As a result of the construction activities, there would be a potential short-term minor impact to soil during site preparation and excavation activities. Impacts would be minimized through implementation of erosion and siltation controls.

Construct Waste Storage Facility (Proposed Action)

Limited soil disturbance is expected under the Proposed Action. As a result of the construction activities, there would be a potential short-term minor impact to soil during site preparation and excavation activities. Impacts would be minimized through implementation of erosion and siltation controls.

Construct Pipeline Student Dormitory (Proposed Action)

Limited soil disturbance is expected under the Proposed Action. As a result of the construction activities, there would be a potential short-term minor impact to soil during site preparation and excavation activities. Impacts would be minimized through implementation of erosion and siltation controls.

Expand Chapel Family Life Center (Proposed Action)

Limited soil disturbance is expected under the Proposed Action. As a result of the construction activities, there would be a potential short-term minor impact to soil during site preparation and excavation activities. Impacts would be minimized through implementation of erosion and siltation controls.

No Action

The No Action Alternatives would have no impact on soil.

4.7 Cultural Resources

The National Historic Preservation Act establishes a program for the preservation of historic properties that are listed or eligible for listing on the NRHP. Section 106 requires federal agencies to consider the effects of their actions and undertakings on these resources, and to avoid, minimize, and mitigate any effects whenever possible. Undertakings that could change in any way the characteristics that qualify the property for inclusion in the NRHP, for better or for worse, are considered to have an “effect.”

Undertakings that do not meet the “no effect” criteria are divided into low-level and high-level impact projects (WPAFB 2006b). Low-level impact projects include shallow, ground-disturbing activities such as landscaping. High-level impact projects include more substantial ground-disturbing activities, such as construction for new underground lines, construction of new roads and paved surfaces, temporary access roads to work sites, and the grading and regrading of existing terrain.

The Area of Potential Effect (APE) for each Proposed Action considers all areas that may be disturbed by construction activities, as well as potential effects to adjacent properties surrounding the construction sites. The majority of the proposed improvements in the Proposed Action would qualify under the “no effect” criteria, simply because they will not occur in the vicinity of any cultural resources.

Area B does encompass two NRHP-listed archaeological sites – the Adena mound (Site 33 GR 31), and the Memorial Mound Group (Site 33 GR 30) (Figure 14). The proposed construction will approach no closer than 1,000 feet of either site; therefore, no impacts to these resources are expected.

As described below, some of the Proposed Actions will occur in eligible facilities or near other eligible or potentially eligible resources. The entomology site will be located within the Wright Field Historic District. In accordance with Section 106, the WPAFB CRM has determined that none of the

Proposed Actions will have a significant impact on any of these resources. These determinations have been confirmed with the Ohio SHPO. On April 13, 2007, WPAFB sent an advance notification letter to the SHPO informing it of the pending BRAC actions and associated EAs. SHPO responded on June 14, 2007, acknowledging the actions. On November 30, 2007, WPAFB sent a letter to SHPO requesting a concurrence of no adverse affect on historic properties resulting from the actions evaluated in this EA. On February 20, 2008, SHPO concurred with WPAFB's finding of no adverse effect on historic properties based on adherence to stipulated conditions (see Appendix F for SHPO correspondence). WPAFB will comply with the conditions as indicated in the following site descriptions.

Facilities 20012 and 20017

Facilities 20012 and 20017 require major interior renovations/alterations to upgrade to the latest facility codes and standards. Additionally, Facility 20017 requires a major exterior alteration/renovation (roof replacement) to meet mission requirements. Facilities 20012 and 20017 are contributing buildings to the Wright Field Historic District. Furthermore, Facility 20012 is individually eligible for the NRHP. The proposed renovations/alterations to Facilities 20012 and 20017 have been coordinated with SHPO. In accordance with SHPO's February 20, 2008, stipulated condition, WPAFB will submit the design plans for the rehabilitation of Facilities 20012 and 20017 to SHPO for review and approval prior to start of construction activities.

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

There are no historic structures in the PBTA. The site is located approximately 0.5 mile from the HPFF. No direct or indirect impact to the HPFF is anticipated from the proposed improvements and uses of the PBTA. Except for very short periods when a convoy is transporting materials and personnel to the site along Hebble Creek Road, no impact to the accessibility of visitors to the historic site is anticipated. On January 14 and 17, 2008, the WPAFB CRM corresponded via e-mail and telephone with the NPS superintendent of the DAHNHP offering him the opportunity to review this EA. The superintendent did not have concerns with the impacts to HPFF from the new missions at the PBTA and did not request to review the EA. In accordance with Memorandum of Agreement (MOA)-508 between the NPS and WPAFB, the base will notify the NPS of any unscheduled closures or restricted hours to HPFF as a result of the new mission activities at the PBTA.

There is one NRHP potentially eligible archaeological site in the PBTA (33-GR-924). Archaeological surveys to date show the extent of the archaeological site's evidence to the west and south of a manhole feature near the proposed wastewater line tie-in to the existing sanitary sewer main (Figure 3). The proposed line would run north-south along an existing lane from the developed area and tie-in to the existing wastewater main approximately 20 feet east of the existing manhole, and outside the recorded limits of the archaeological site. Given that the construction would avoid site 33-GR-924 and occur in areas previously disturbed for the lane and the existing wastewater main, no impacts will occur to this archaeological site.

In the WPAFB November 30, 2007, correspondence to SHPO, the new proposed sanitary waste line was identified to be connected to the wastewater main at the existing manhole located at the boundary of archaeological site 33-GR-924 (south and west of the manhole). In February 2008, WPAFB determined that the connection of the sanitary waste line would be connected to the wastewater main approximately 20 feet east of the manhole, thereby completely avoiding site 33-GR-924. In a February 29, 2008 e-mail (see Appendix F), SHPO concurred that this location would have no adverse effect on site 33-GR-924 and that the condition in its February 20, 2008, letter to complete Phase II testing of site 33-GR-924 to determine NRHP eligibility prior to initiating construction activities was no longer required.

Since the installation of the proposed new sanitary waste line will not impact site 33-GR-924, the stipulations to avoid impacts to cultural resources listed in WPAFB's November 30, 2007, correspondence have been revised as follows:

- Prior to the start of any work, WPAFB CRM will conduct a site visit with the construction contractor to identify the location of site 33-GR-924 to the contractor. At that time, the CRM will install stakes and caution tape around the section of the pertinent boundary of site 33-GR-924 near the sanitary line installation area, and notify workers not to cross the tape.
- Once the sanitary line installation begins, the CRM will conduct weekly inspections at the site to ensure work does not encroach beyond the caution tape.

Should inadvertent discoveries of cultural resources occur during any ground-disturbing activities, the work will immediately cease and the base CRM will be notified. The procedures for inadvertent

discoveries outlined in Section D.2.4 in the WPAFB ICRMP (2006b), which include SHPO notification, will be followed. In addition, the construction contractor will be made aware of WPAFB procedures prior to the start of any construction activities.

Add/Alter Facility 20620 (Proposed Action)

The area surrounding the Sensors Directorate has been determined to have a low likelihood of containing archaeological artifacts because of past disturbance; however, the Sensors Directorate Facility 20620 itself is an eligible historic facility, due to the research conducted to develop the stealth aircraft during the Cold War. The Proposed Action will include renovation of some of the interior of the structure, as well as the building addition. The proposed modifications will affect the architecture somewhat, but they will not affect the historic value of the structure. WPAFB is committed to designing the proposed Sensors Directorate addition and renovation to conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. In accordance with SHPO's February 20, 2008, stipulated condition, WPAFB will submit the design plans and specifications for the rehabilitation and addition to Facility 20620 to the SHPO for review and approval prior to start of construction activities.

Expansion of Facility 20838 (Proposed Action)

No historic buildings or archaeological sites would be affected by this action. The site is not located in a historic district.

Construct Entomology Site (Proposed Action)

No historic buildings or archaeological sites would be directly affected by this action. The site is located in the Wright Field Historic District near Facility 20079, a historic structure, and northeast of the accelerated runway. The proposed one story, 2,300 ft² structure and associated parking lot will be located at the end of an existing paved road (12th Street), in an area where several small research structures once stood. The Proposed Action is expected to have no effect on the historic structures, the Wright Field Historic District, or the cultural landscape. In accordance with SHPO's February 20, 2008, stipulated condition, WPAFB will submit the elevation drawings of the proposed entomology laboratory to SHPO for review and approval prior to start of construction.

Construct Waste Storage Facility (Proposed Action)

No historic buildings or archaeological sites would be affected by this action. The site is located beyond the limits of the Wright Field Historic District.

Construct Pipeline Student Dormitory (Proposed Action)

No historic buildings or archaeological sites would be affected by this action. The site is not located in a historic district.

Expand Chapel Family Life Center (Proposed Action)

No historic buildings or archaeological sites would be affected by this action. The site is not located in a historic district.

No Action

There would be no impacts to cultural resources under the No Action Alternative.

4.8 Air Quality

Locate Remote Field Training Area at Prime BEEF Training Area (Proposed Action)

In the short term (during construction), there would be localized negative impacts to air quality from the Proposed Actions. Impacts to air quality from construction activities would include the generation of fugitive dust and particulates from the grading of soil, installation of staging pads, installation of utilities, and other associated construction activities that may be necessary.

OAC 3745-17-08, *Restriction of Emission of Fugitive Dust*, specifies that buildings or roads may not be used, constructed, altered, repaired, or demolished without taking or installing reasonably available control measures to prevent fugitive dust from becoming airborne. Mitigation measures to reduce fugitive dust would be implemented during demolition and construction in accordance with this regulation. Typical mitigation measures to control the fugitive dust include the use of water or other suitable dust suppression chemicals.

Calculations were made to estimate the amount of fugitive dust that would be generated by the project during construction, which considers the area of soil that is exposed to the wind and construction traffic at one time, and the length of time it is exposed. These calculations were

performed using USEPA emission factors for heavy construction operations (USEPA, 1995). The estimated area for the overall project is 174,240 ft² (4 acres). Construction of the RFTS is scheduled to begin in FY 2008. For the purposes of calculating impacts from fugitive dust, it was assumed that construction would last for 12 months. Based on these assumptions, it is estimated that the particulate emissions would be 2.3 tpy for construction of the RFTS. This amount is approximately 12 percent of the estimated normal baseline (19.68 tpy) at WPAFB (WPAFB, 2006d). These calculations assume that 80 percent of the particulates will be controlled using the mitigation measures described above. Fugitive dust emissions calculations and assumptions for the calculations are provided in Appendix G.

As discussed below, three BRAC facilities (Vivarium, entomology site, and waste storage facility) are scheduled to be constructed during this same time period (that is, FY 2008). The total calculated emissions for all four Proposed Actions would be 3.11 tpy.

The VOC and/or NO_x emissions (if any) from fuel combustion in construction equipment would be expected to be negligible and do not warrant a detailed emissions estimation. The VOC and NO_x emissions would be below the de minimis emission levels area of 50 tpy for VOCs and 100 tpy for NO_x, and thus, in accordance with 40 CFR 93.153(c)(1), a conformity determination is not required. The emissions from the generator to be used during training exercises will also likely fall below the de minimis emission level, but the specifications of the generator to be used are not available at this time. When available, the specifications for the generator will be provided to the 88 ABW/CEVY Air Program Manager for a determination of air source PTI requirements.

Add/Alter Facility 20620 (Proposed Action)

Impacts to air quality under this Proposed Action would be similar to that described above for the RFTS. There would be localized negative impacts to air quality from the Proposed Action. Impacts to air quality from construction activities would include the generation of fugitive dust and particulates from the removal and grading of soil, excavation operations, and other associated construction activities that may be necessary.

Calculations were made to estimate the amount of fugitive dust that would be generated by the project during construction. The estimated area for the overall project is 217,800 ft² (5 acres). The

add/alter Facility 20620 project is scheduled to begin in FY 2009. For the purposes of calculating impacts from fugitive dust, it was assumed that construction would last for 12 months. Based on these assumptions, it is estimated that the particulate emissions would be 2.9 tpy for construction of the add/alter Facility 20620 project. This amount is approximately 15 percent of the estimated normal baseline (19.68 tpy) at WPAFB (WPAFB, 2006d). Fugitive dust emissions calculations and assumptions for the calculations are provided in Appendix G.

As discussed below, two BRAC facilities (pipeline student dormitory and expansion of the Chapel Family Life Center) are scheduled to be constructed during this same time period (that is, FY 2009). The total calculated emissions for these three Proposed Actions would be 6.48 tpy, which exceeds the de minimis particulate emission thresholds of 10 pounds per day and 5 tpy established by Ohio EPA (OAC 3754-15-05). To meet these limits, WPAFB would implement further controls to limit fugitive dust, which could include limiting the area exposed at one time. As needed, WPAFB will coordinate with Ohio EPA to amend the Title V permit to allow for increased emissions during construction activities.

Expansion of Facility 20838 (Proposed Action)

Impacts to air quality under this Proposed Action would be similar to that described above for the RFTS. There would be localized negative impacts to air quality from the Proposed Action. Impacts to air quality from construction activities would include the generation of fugitive dust and particulates from the removal and grading of soil, excavation operations, and other associated construction activities that may be necessary.

Calculations were made to estimate the amount of fugitive dust that would be generated by the project during construction. The estimated area for the overall project is 13,068 ft² (0.3 acre). The construction of the Vivarium addition is scheduled to begin in FY 2008. For the purposes of calculating impacts from fugitive dust, it was assumed that construction would last for 12 months. Based on these assumptions, it is estimated that the particulate emissions would be 0.17 tpy. This amount is approximately 0.01 percent of the estimated normal baseline (19.68 tpy) at WPAFB (WPAFB, 2006d). Fugitive dust emissions calculations and assumptions for the calculations are provided in Appendix G.

As discussed above, three BRAC facilities (RFTS, entomology site, and waste storage facility) are scheduled to be constructed during this same time period (that is, FY 2008). The total calculated emissions for all four Proposed Actions would be 3.11 tpy.

Construct Entomology Site (Proposed Action)

Impacts to air quality under this Proposed Action would be similar to that described above for the RFTS. There would be localized negative impacts to air quality from the Proposed Action. Impacts to air quality from construction activities would include the generation of fugitive dust and particulates from the removal and grading of soil, excavation operations, and other associated construction activities that may be necessary.

Calculations were made to estimate the amount of fugitive dust that would be generated by the project during construction. The estimated area for the overall project is 26,136 ft² (0.6 acre). The construction of the entomology site is scheduled to begin in FY 2008. For the purposes of calculating impacts from fugitive dust, it was assumed that construction would last for 12 months. Based on these assumptions, it is estimated that the particulate emissions would be 0.35 tpy. This amount is approximately 0.02 percent of the estimated normal baseline (19.68 tpy) at WPAFB (WPAFB, 2006d). Fugitive dust emissions calculations and assumptions for the calculations are provided in Appendix G.

As discussed above, three BRAC facilities (RFTS, Vivarium, and waste storage facility) are scheduled to be constructed during this same time period (that is, FY 2008). The total calculated emissions for all four Proposed Actions would be 3.11 tpy.

Construct Waste Storage Facility (Proposed Action)

Impacts to air quality under this Proposed Action would be similar to that described above for the RFTS. There would be localized negative impacts to air quality from the Proposed Action. Impacts to air quality from construction activities would include the generation of fugitive dust and particulates from the removal and grading of soil, excavation operations (utility tie-ins), and other associated construction activities that may be necessary.

Calculations were made to estimate the amount of fugitive dust that would be generated by the project during construction. The estimated area for the overall project is 21,780 ft² (0.5 acre). The construction of the waste storage facility is scheduled to begin in FY 2008. For the purposes of calculating impacts from fugitive dust, it was assumed that construction would last for 12 months. Based on these assumptions, it is estimated that the particulate emissions would be 0.29 tpy. This amount is approximately 0.01 percent of the estimated normal baseline (19.68 tpy) at WPAFB (WPAFB, 2006d). Fugitive dust emissions calculations and assumptions for the calculations are provided in Appendix G.

As discussed above, three BRAC facilities (RFTS, Vivarium, and entomology site) are scheduled to be constructed during this same time period (that is, FY 2008). The total calculated emissions for all four Proposed Actions would be 3.11 tpy.

Construct Pipeline Student Dormitory (Proposed Action)

Impacts to air quality under this Proposed Action would be similar to that described above for the RFTS. There would be localized negative impacts to air quality from the Proposed Action. Impacts to air quality from construction activities would include the generation of fugitive dust and particulates from the removal and grading of soil, excavation operations, and other associated construction activities that may be necessary.

Calculations were made to estimate the amount of fugitive dust that would be generated by the project during construction. The estimated area for the overall project is 217,800 ft² (5 acres). The Construction of the dormitory is scheduled to begin in FY 2009. For the purposes of calculating impacts from fugitive dust, it was assumed that construction would last for 12 months. Based on these assumptions, it is estimated that the particulate emissions would be 2.9 tpy for construction the dormitory. This amount is approximately 15 percent of the estimated normal baseline (19.68 tpy) at WPAFB (WPAFB, 2006d). Fugitive dust emissions calculations and assumptions for the calculations are provided in Appendix G.

Two BRAC facilities, add/alter Facility 20620 (discussed above) and expand the Chapel Family Life Center (discussed below) are scheduled to be constructed during this same time period (that is, FY 2009). The total calculated emissions for these three Proposed Actions would be 6.48 tpy, which

exceeds the de minimis particulate emission thresholds of 10 pounds per day and 5 tpy established by Ohio EPA (OAC 3754-15-05). To meet these limits, WPAFB would implement further controls to limit fugitive dust, which could include limiting the area exposed at one time. As needed, WPAFB will coordinate with Ohio EPA to amend the Title V permit to allow for increased emissions during construction activities.

Expand Chapel Family Life Center (Proposed Action)

Impacts to air quality under this Proposed Action would be similar to that described above for the RFTS. There would be localized negative impacts to air quality from the Proposed Action. Impacts to air quality from construction activities would include the generation of fugitive dust and particulates from the removal and grading of soil, excavation operations, and other associated construction activities that may be necessary.

Calculations were made to estimate the amount of fugitive dust that would be generated by the project during construction. The estimated area for the overall project is 54,450 ft² (1.25 acres). The Construction of the dormitory is scheduled to begin in FY 2009. For the purposes of calculating impacts from fugitive dust, it was assumed that construction would last for 12 months. Based on these assumptions, it is estimated that the particulate emissions would be 0.72 tpy for construction the dormitory. This amount is approximately 0.04 percent of the estimated normal baseline (19.68 tpy) at WPAFB (WPAFB, 2006d). Fugitive dust emissions calculations and assumptions for the calculations are provided in Appendix G.

As discussed above, two BRAC facilities (add/alter Facility 20620, pipeline student dormitory) are scheduled to be constructed during this same time period (that is, FY 2009). The total calculated emissions for these three Proposed Actions would be 6.48 tpy, which exceeds the de minimis particulate emission thresholds of 10 pounds per day and 5 tpy established by Ohio EPA (OAC 3754-15-05). To meet these limits, WPAFB would implement further controls to limit fugitive dust, which could include limiting the area exposed at one time. As needed, WPAFB will coordinate with Ohio EPA to amend the Title V permit to allow for increased emissions during construction activities.

No Action

No impacts to air quality would occur under all the No Action Alternative.

4.9 Noise

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

During implementation of the proposed construction actions, there would be minor, negative short-term impacts on ambient noise levels in the project areas from the operation of heavy machinery and equipment, if needed. Heavy equipment such as bulldozers, graders, backhoes, excavators, and dump trucks would generate noise that could affect the construction workers. Construction equipment typically emits noise in the 86 to 94 dB range. Several examples of noise levels in A-weighted decibels (dBA) are listed in Table 7. Heavy duty trucks generate a noise level of approximately 90 dBA (very loud) at 50 feet. Attenuation to 65 dBA (moderately loud) would occur at a distance of approximately 800 to 1,000 feet depending on climatic conditions, topography, vegetation, and man-made barriers (Generac Power System, Inc., 2004, as cited in USAF, 2007).

Construction workers would use hearing protection and would follow OSHA standards and procedures. Onsite workers in the nearby facilities would experience short-term, intermittent muffled noise during the workday. This intermittent exposure could be a nuisance, but would not pose a threat to hearing.

Once construction of the staging pads and decontamination facility is complete, noise associated with construction activities would cease. Operations of the RFTS would have no appreciable impact on noise.

TABLE 7
A-Weighted (dBA) Sound Levels of Typical Noise Environments

| dBA | Overall Level | Noise Environment |
|-----|----------------------------------------------------|-------------------------------------------------------------------------|
| 120 | Uncomfortably loud (32 times as loud as 70 dBA) | Military jet takeoff at 50 feet |
| 100 | Very loud (8 times as loud as 70 dBA) | Jet flyover at 1,000 feet |
| 90 | Very Loud | Heavy-duty truck, average traffic |
| 80 | Loud (2 times as loud as 70 dBA) | Propeller plane flyover at 1,000 feet Diesel truck 40 mph at 50 feet |
| 70 | Moderately loud | Freeway at 50 feet from pavement edge Vacuum cleaner (indoor) |
| 65 | Moderately loud | Gas powered generator |
| 60 | Relatively quiet (1/2 as loud as 70 dBA) | Air condition unit at 10 feet Dishwasher at 10 feet (in door) |
| 50 | Quiet (1/4 as loud as 70 dBA) | Large transformers Small private office (in door) |
| 40 | Very quiet (1/8 as loud as 70 dBA) | Bird calls Lowest limit of urban ambient sound |
| 10 | Extremely quiet (1/64 as loud as 70 dBA) | Just audible |
| 0 | Threshold of hearing | |

Source: Wyle Research Corporation 1992

Add/Alter Facility 20620 (Proposed Action)

Impacts during the renovation and construction of the addition to Facility 20620 would be similar to those described above for the RFTS. Noise would be associated with construction activities, which would be limited to typical working hours. Once construction of the addition is complete, noise associated with construction activities would cease. Activities associated with the add/alter Facility 20620 project would have no appreciable impact on noise.

Expansion of Facility 20838 (Proposed Action)

Impacts during the construction of the addition to Facility 20838 would be similar to those described above for the RFTS. Noise would be associated with construction activities, which would be limited to typical working hours. Once construction of the addition is complete, noise associated with construction activities would cease. Operations of the expanded Vivarium would have no appreciable impact on noise.

Construct Entomology Site (Proposed Action)

Impacts during the construction of the entomology site would be similar to those described above for the RFTS. Noise would be associated with construction activities, which would be limited to typical working hours. Once construction of facility is complete, noise associated with construction activities would cease. Operations of the entomology site would have no appreciable impact on noise.

Construct Waste Storage Facility (Proposed Action)

Impacts during the construction of the waste storage facility would be similar to those described above for the RFTS. Noise would be associated with construction activities, which would be limited to typical working hours. Once construction of facility is complete, noise associated with construction activities would cease. Operations of the waste storage facility would have no appreciable impact on noise.

Construct Pipeline Student Dormitory (Proposed Action)

Impacts during the construction of the dormitory would be similar to those described above for the RFTS. Noise would be associated with construction activities, which would be limited to typical working hours. Once construction of facility is complete, noise associated with construction activities would cease. Operations of the dormitory would have no appreciable impact on noise.

Expand Chapel Family Life Center (Proposed Action)

Impacts during the construction of the Chapel Family Life Center addition would be similar to those described above for the RFTS. Noise would be associated with construction activities, which would be limited to typical working hours. Once construction of facility is complete, noise associated with construction activities would cease. Operations of the expanded Chapel Family Life Center would have no appreciable impact on noise.

No Action

There would be no impacts under the No Action Alternatives, as no construction-related noise would be generated.

4.10 Health and Safety

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

Because construction workers conducting the construction would be responsible for complying with standard operating procedures and applicable health and safety regulations, no impacts to health and safety would be expected.

As discussed previously, the PBTA lies outside the APZs.

Prior to excavating soil and installing utilities associated with the sanitary line, digging clearances would be obtained from Base Civil Engineering and Base Utilities. As discussed in Section 3.10, FTA1 lies within the PBTA. FTA1 is in the vicinity of the location of the new sanitary line. This IRP site has no digging restrictions associated with it; however, soil disturbing activities must be approved by Base Civil Engineering and Environmental Management Division personnel. An investigation of FTA1 concluded that the IRP site poses minimal risk to human health (IT, 1995b). Therefore, it is assumed that the location of FTA1 within the training area would not impact the health of persons using the site.

At the PBTA, there is an area within which training pyrotechnics (such as ground burst simulators) may be used. No impacts are anticipated because the appropriate safety protocols will be in place when this area is in use.

Add/Alter Facility 20620 (Proposed Action)

As discussed above, construction workers would be responsible for complying with standard operating procedures and applicable health and safety regulations. Therefore, no impacts to health and safety would be expected.

The location of the add/alter Facility 20620 project is outside all APZs, IRPs, and Q/D zones.

Expansion of Facility 20838 (Proposed Action)

As discussed above, construction workers would be responsible for complying with standard operating procedures and applicable health and safety regulations. Therefore, no impacts to health and safety would be expected.

The location of the Vivarium expansion is outside all APZs, IRPs, and Q/D zones.

Construct Entomology Site (Proposed Action)

As discussed above, construction workers would be responsible for complying with standard operating procedures and applicable health and safety regulations. Therefore, no impacts to health and safety would be expected.

The location of the entomology site is outside of all APZs and Q/D zones.

As discussed in Section 3.4.3, the proposed location of the entomology site is on the western edge of the former Building 79A-D/95 complex AOC. Low concentrations of TCE were detected in soil at the AOC; the maximum detected concentration was 1.1 parts per billion. The site investigation (Shaw, 2006) conducted at the AOC concluded that exposures to soil due to short-term construction activities at the Building 79A-D/95 Complex posed no unacceptable risk. The soils at the AOC are considered to pose little, if any, threat to human health. Therefore, a Record of Decision is being prepared; the recommendation is No Further Action for the soil (WPAFB, 2007d). Solvents such as TCE and vinyl chloride were detected in shallow groundwater (sand stringers). Groundwater at the former Building 79A-D/95 complex AOC is being monitored under the Long-term Monitoring Program at WPAFB. Groundwater data from four monitoring wells collected in April 2007 at the former Building 79A-D/95 complex AOC show TCE concentrations range from 14 to 39 parts per million (WPAFB, 2007d). Groundwater is found sporadically in the upland till zone.

Soil and groundwater samples have not been collected at the proposed location of the entomology site. Due to the site proximate to former Building 79A-D/95 Complex AOC, environmental sampling consisting of shallow soil borings to 20 feet bgs is recommended to determine the presence of potential contamination at the site before construction begins. Shallow soil borings and shallow groundwater, if present, are sampled for VOCs only. Due to the proximity of monitoring wells with detected solvents, the potential for vapor intrusion also should be evaluated. Vapor intrusion occurs when volatile organic compounds, such as TCE, volatilize from groundwater or soil, migrate through soil gas and subsequently are transported into indoor spaces, potentially producing inhalation exposure. As mentioned in Section 2.6, a vapor barrier is part of the building design for the entomology site.

Construct Waste Storage Facility (Proposed Action)

As discussed above, construction workers would be responsible for complying with standard operating procedures and applicable health and safety regulations. Therefore, no impacts to health and safety would be expected.

The proposed location of the waste storage facility is outside all APZs and Q/D zones.

Prior to any soil disturbances, digging clearances would be obtained from Base Civil Engineering and Base Utilities. As discussed in Section 3.10, the proposed site of the waste storage facility lies within EFDZ4. This IRP site has no digging restrictions associated with it; however, soil disturbing activities must be approved by Base Civil Engineering and Environmental Management Division personnel. An investigation of EFDZ4 concluded that there are no adverse health effects are expected from EFDZ4 (WPAFB, 1998).

Construct Pipeline Student Dormitory (Proposed Action)

As discussed above, construction workers would be responsible for complying with standard operating procedures and applicable health and safety regulations. Therefore, no impacts to health and safety would be expected.

The location of the entomology site is outside all APZs, IRPs, and Q/D zones.

Expand Chapel Family Life Center (Proposed Action)

As discussed above, construction workers would be responsible for complying with standard operating procedures and applicable health and safety regulations. Therefore, no impacts to health and safety would be expected.

The location of the Chapel Family Life Center is outside all APZs, IRPs, and Q/D zones.

No Action

No impacts to health and safety would occur under all the No Action Alternatives.

4.11 Socioeconomics

Proposed Action

The estimated total construction cost for all of the projects considered in this EA is approximately \$100 million, including construction-related employment, materials, and supplies. These construction costs would equal about 7 percent of WPAFB's annual expenditures for goods and services and would have a beneficial, although temporary, effect on the local and regional economy. It is likely that much of the material and work force for the projects would be from local sources, or sources within Ohio or adjacent states. Businesses near WPAFB, such as lodging, gas stations, and restaurants, also would benefit from additional sales to construction workers.

There would be both short-term and long-term beneficial impacts on the local and regional economy from the additional staff. Staff at the Vivarium, entomology site, EMEDS training, and the pipeline student dormitory will be associated with the HPW; the economic impact of these staff has been enumerated in previous EA. The Sensors Directorate mission would account for an additional 600 staff to the base. Beneficial long-term economic development would result from the additional personnel and their families relocating to the area. While some of these positions may be filled by persons who already reside in the area, many will be specialists who will relocate with the missions to the southwest Ohio area. The Dayton Development Coalition has estimated that the BRAC mission relocation to WPAFB could have as much as a \$100 million positive impact on the local economy (*Dayton Daily News*, January 28, 2007). Given that the Sensors Directorate will account for about one-third of the additional BRAC staff, it would constitute a significant portion of the beneficial economic impact on the region.

Housing is available in the four-county area surrounding WPAFB. The incoming personnel to the region could be accommodated by the existing housing stock, and would not likely affect housing demand.

No Action

This alternative would require no construction and therefore would generate no construction-related employment. This alternative would cause no change in employment at WPAFB.

4.12 Transportation/Traffic

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

Vehicular access to the PBTA for the EMEDS training will be transitory. Traffic associated with the training missions will typically involve a convoy of a few vehicles. Assuming training traffic originates at Area B, it would travel east along SR 444, a four-lane divided highway, to Communications Boulevard. A left turn lane is provided on SR 444 at this intersection, so that the training vehicles queuing for this turn would cause minimal backup along SR 444.

The access to the site from Communications Boulevard, Battle Creek Road, and Hebble Creek Road is largely used only by security forces for routine patrol and occasional visitors to the Huffman Prairie. The relatively few additional vehicles for the proposed training are expected to have no impact on traffic conditions. Except for the short time when the convoy is entering or exiting the PBTA, there will be no impact to visitor access to the Huffman Prairie.

Use of this site for training will require minimal construction traffic, and therefore will have minimal short-term impact on traffic during construction.

Add/Alter Facility 20620 (Proposed Action)

Approximately 600 additional personnel will be employed at the Sensors Directorate. The additional vehicular traffic associated with these staff was included in the analysis performed for the BRAC Infrastructure Upgrade Project. The roadway improvements proposed as part of that project were designed to accommodate this additional traffic. Traffic analysis for the Hilltop District in the built condition, and assuming the future traffic volumes of all BRAC and other planned facilities, shows that the proposed roadway improvements will provide an acceptable Level of Service for roadways in the Hilltop District. Therefore, the additional traffic generated by the Sensors Directorate is expected to have no significant impact on Area B traffic operations.

While the plan has not been finalized, the Proposed Action may affect some of the existing parking area, and will likely require some additional parking. The parking lot south of the campus is rarely if ever at capacity now, so some of the additional parking needs can be provided by that existing lot. Any additional parking area, if needed, would likely include expansion of the lot on Q Street north of Avionics Circle and/or expansion of the south lot.

The construction of the Sensors Directorate addition will be a considerable effort. Over the short term, the addition of construction traffic to the normal traffic volumes entering during the morning hours may have a short-term negative impact on the traffic along National Road at Gate 19B (nearest the construction site). There also may be short-term disruptions of traffic flow within the Hilltop District during construction. While inconvenient, access will be maintained to all active facilities throughout construction.

Expansion of Facility 20838 (Proposed Action)

The personnel associated with the Vivarium will be part of the HPW, which will total 1,200 staff. The additional traffic generated by these staff has been evaluated and considered in the BRAC Infrastructure Upgrade Project. The proposed roadway improvements under that project are expected to accommodate all of the additional BRAC traffic. Therefore, the Vivarium facility is expected to have no measurable effect on the traffic operations in Area B. Additional parking proposed for the HPW between 5th and 10th streets would accommodate the parking needs for staff at the Vivarium.

Similar to the Sensors Directorate, although smaller, construction traffic associated with this project may have a minor, temporary impact on traffic in the Hilltop area.

Construct Entomology Site (Proposed Action)

The entomology site will house approximately four personnel. The few additional trips generated by these staff are expected to have no measurable effect on the traffic operations in Area B. A proposed six-slot parking area would provide parking for staff at the laboratory building. The project will have no impact on parking near Facility 20079, which is proposed for reuse.

Construction traffic associated with this project may have a minor, temporary impact on traffic in the Hilltop Area.

Construct Waste Storage Facility (Proposed Action)

This facility will simply expand the capacity of the existing waste storage facility. It is expected to generate no additional traffic.

Construct Pipeline Student Dormitory (Proposed Action)

The pipeline student dormitory is expected to house approximately 190 students. Students will be bused to and from the training facilities at Area B, causing minimal routine additional traffic at either location.

It is assumed that there will be one personally owned vehicle for every four students (about 50 vehicles). On that assumption, it is estimated that there would be no more than an additional 150 daily trips at the Kittyhawk area. This additional traffic would represent less than a 2 percent increase over the existing daily traffic at Kittyhawk, and therefore is expected to have no significant impact on traffic in the Kittyhawk area. The relatively few additional trips also are expected to have minimal impact on the operations of local roadways, namely SR 444, in the Kittyhawk area.

Expand Chapel Family Life Center (Proposed Action)

The expansion of the Chapel Family Life Center is not expected to substantially increase the volume of vehicular traffic to the center. Assuming an additional 60 persons visit the center per day, there would be on average an additional 15 to 20 vehicles per day at the center. Therefore, no impact to local traffic operations or parking capacity is expected.

No Action

The No Action Alternative would have no impact on the roadway network in the project area.

4.13 Utilities

4.13.1 Steam Heating

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

This project has no need for steam heating, as there are no proposed permanently occupied buildings.

Add/Alter Facility 20620 (Proposed Action)

Steam heating requirements for the Sensors Directorate addition were included in the BRAC Infrastructure Upgrade Project analysis.

Expansion of Facility 20838 (Proposed Action)

Similar to the Sensors Directorate expansion, the Vivarium was evaluated with the BRAC Infrastructure Upgrade Project. The anticipated steam heating needs for the facility will be within the capacity of the existing system.

Construct Entomology Site (Proposed Action)

As a small facility, the steam heating requirements can be accommodated by a tie-in to existing steam heating main line near the site.

Construct Waste Storage Facility (Proposed Action)

The proposed facility will require no steam heating connection.

Construct Pipeline Student Dormitory (Proposed Action)

The steam heating requirement for this facility is anticipated to be within the capacity of the existing system in the Kittyhawk area and would be accommodated by tie-in to the existing main line near the site.

Expand Chapel Family Life Center (Proposed Action)

Heat is supplied to the existing facility by natural gas furnace. The facility's system will be upgraded as needed for the addition. There is no steam heating supplied to the Prairies area.

No Action

The No Action Alternative also would have no impact on steam heating.

4.13.2 Water and Wastewater

Public water and wastewater systems are regulated under the federal CWA. In Ohio, the authority to regulate these systems has been delegated to the Ohio EPA. Ohio EPA requires a PTI for replacement of existing water and wastewater lines, or additions to these systems. The Ohio EPA Division of Drinking and Groundwater reviews and approves plans for the expansion of public drinking water supplies pursuant to OAC 3745-91-02. The Ohio EPA Division of Surface Water reviews and approves improvements to wastewater systems pursuant to OAC 3745-42-02. These reviews ensure the safety of the water supply, minimal risk of groundwater contamination, and

capacity of the wastewater collection and treatment system. As the final design is selected and developed, WPAFB would coordinate the design with Ohio EPA to obtain the required approvals.

The BRAC Infrastructure Upgrade Project found that the Dayton WWTP, which receives wastewater from all of the project sites, has adequate capacity for all of the proposed projects. Prior to the construction of additional wastewater lines, the design drawings along with a cover letter would be submitted by WPAFB to the City of Dayton WWTP. The Dayton WWTP would evaluate the design relative to the capacity of the WWTP and provide a concurrence letter. The design/construction contractor would then prepare the PTI application, including the design drawings, specifications, and WWTP concurrence letter. The base would submit the application package to Ohio EPA.

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

The Proposed Action would add a wastewater lift station and force main from the PBTA to an existing 24-inch-diameter main near SR 444. The new line would tie in to the main at an existing manhole. This additional line would eliminate the need for storage and trucking of wastewater from the PBTA to another disposal site. The new wastewater line would be available for use by all users of the PBTA, not just EMEDS training. However, given that the area is only periodically used by a limited number of personnel, and the only source of wastewater would be normal hygiene uses (showers, toilets). The anticipated load from all users of the PBTA would not exceed the available capacity in the 24-inch main. This sanitary main currently runs at less than 25 percent of its capacity. The additional peak flow from the PBTA would only be about 50 gpm, well within the existing capacity of the main (about 7 million gpm). Therefore, the project would have no impact on the wastewater system.

An upgrade of an existing non-potable water line would be installed at the site. This new line will not alter the water requirements at the site. Potable water will continue to be trucked in as needed for activities at the site.

Add/Alter Facility 20620 (Proposed Action)

Water and wastewater requirements for the Sensors Directorate addition were included in the BRAC Infrastructure Upgrade Project analysis. The requirements for water for the proposed facility will be

within the capacity of the existing wells and treatment facilities. The existing on-base water supply wells and treatment system have more than sufficient capacity for the anticipated water needs. While the water system is generally adequate to supply the needed water, the analysis found that the proposed facility will need an individual fire pump to increase flow during a fire event. The pump will be part of the facility expansion.

The BRAC Infrastructure Upgrade assessment also found that the wastewater collection system has sufficient capacity for all of the existing and near future loads. The Sensors Directorate area was found to have adequate sanitary sewer mains. The analysis found that the Sensors Directorate addition loads can be accommodated by the “M” line. Lengths of pipe that would reach or exceed capacity with the future loads will be replaced with larger diameter pipes under the BRAC Infrastructure Upgrade Project.

Expansion of Facility 20838 (Proposed Action)

Similar to the Sensors Directorate expansion, the Vivarium was evaluated with the BRAC Infrastructure Upgrade Project. The anticipated water needs and wastewater flow from the facility will be within the capacity of these systems. The analysis found that the Vivarium addition loads can be accommodated by the “L” wastewater line.

Construct Entomology Site (Proposed Action)

As a small facility with few staff, the water and wastewater requirements are anticipated to be minor relative to the existing capacity in Area B, as evaluated for the BRAC Infrastructure Upgrade Project. The laboratory is estimated to have an average water/wastewater flow of only 150 gpd. These utilities can be accommodated by tie-ins to existing water and wastewater mains near the site.

Construct Waste Storage Facility (Proposed Action)

As an expansion of a warehouse/storage facility, the water and wastewater requirements for this facility would be minimal. No measurable impact to these systems is expected.

Construct Pipeline Student Dormitory (Proposed Action)

The water and wastewater requirements for this facility are anticipated to be within the capacity of the existing systems in the Kittyhawk area. The dormitory is estimated to have an average

water/wastewater flow of 14,400 gpd. These utilities would be accommodated by tie-ins to existing mains near the site.

Expand Chapel Family Life Center (Proposed Action)

The proposed project would minimally alter the water use and wastewater requirements of this facility, and these needs can be met by the existing service. The additional flow is estimated to be only 300 gpd, assuming an additional 60 persons visit the center per day. No measurable impact to these systems is expected.

No Action

The No Action Alternative also would have no impact on water or wastewater.

4.13.3 *Natural Gas*

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

This facility currently has no natural gas supply. Activities will continue to use portable tanks trucked in for each activity.

Add/Alter Facility 20620 (Proposed Action)

Additional natural gas requirements for the building addition can be supplied from the existing main north of Facility 20620.

Expansion of Facility 20838 (Proposed Action)

Any natural gas requirements can be supplied by the existing system within Facility 20838.

Construct Entomology Site (Proposed Action)

This facility would have minimal natural gas requirements. No gas supply lines are proposed.

Construct Waste Storage Facility (Proposed Action)

This facility would have no natural gas requirements. No gas supply lines are proposed.

Construct Pipeline Student Dormitory (Proposed Action)

This facility would have no natural gas requirements. No gas supply lines are proposed.

Expand Chapel Family Life Center (Proposed Action)

Natural gas is used for heating at this facility. Any additional natural gas requirements can be supplied by the existing system within Facility 20229.

No Action

The No Action Alternative also would have no impact on the natural gas system.

4.13.4 Electrical

Locate Remote Field Training Site at Prime BEEF Training Area (Proposed Action)

Minor service extensions will be added to the electrical system at the PBTA. These services can be supplied from the main electrical service to the area, with no infrastructure upgrades needed beyond the project area limits.

Add/Alter Facility 20620 (Proposed Action)

Service to the Sensors Directorate would be from Substation A on Hobson Way. The existing 12.47 kilovolt (kV) system was evaluated for the BRAC Infrastructure Upgrade Project to determine its capacity to serve the anticipated future loads, including all BRAC missions relocating to the Hilltop Area and other programmed facilities. The existing 69 kV supply and transmission system at Substation A was found to be adequate for current and future loads. Some new switchgear will be added to Substation A to supply new distribution circuits as part of the BRAC Infrastructure Upgrade Project.

Expansion of Facility 20838 (Proposed Action)

Like the Sensors Directorate addition, the Vivarium project was evaluated with other BRAC missions proposed in Area B. The evaluation found that the Vivarium also could be supplied electrical service from Substation A with the BRAC Infrastructure Upgrade Project.

Construct Entomology Site (Proposed Action)

The electrical requirements for this facility can be supplied by tie-in to the existing nearby power lines.

Construct Waste Storage Facility (Proposed Action)

Service lines to the site area adequate, although the current transformer (225 kVA) will need be replaced with a 300 kVA transformer. This upgrade will not affect service to any other facilities.

Construct Pipeline Student Dormitory (Proposed Action)

The electrical requirements for this facility can be supplied by tie-in to the existing nearby power lines.

Expand Chapel Family Life Center (Proposed Action)

As an expansion of an existing facility, the electrical requirements for this project can be supplied from the existing service to the facility. No impacts to the electrical system are anticipated.

No Action

The No Action Alternative also would have no impact on the electrical system.

4.13.5 Communications

Communications lines are present near each of the project sites. Minor system upgrades and new tie-ins to the existing lines would be installed as needed. There would be no impact to the communications service to any existing facility.

No Action

The No Action Alternative also would have no impact on the communications system.

4.14 Environmental Justice

Construction associated with the proposed BRAC projects would occur within the boundaries of WPAFB. As discussed in Section 4.11, there would be both short-term and long-term beneficial impacts on the local and regional economy from the construction and operation of the facilities that will support additional new staff at WPAFB. There is little potential for the Proposed Action to have a disproportionately high adverse human health or environmental effect on low-income and minority populations that are located outside the boundaries of WPAFB.

No Action

There would be no environmental justice issues with the No Action Alternative.

4.15 Cumulative Impacts

Cumulative effects are those that may result from the incremental impact of the federal action (construction of proposed facilities) when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such actions (40 CFR § 1508.7).

4.15.1 Area B Projects

WPAFB is preparing several projects in Area B besides the projects that are evaluated in this EA. In addition to the proposed addition to Facility 20838, alteration/addition to Facility 20620, and construction of the waste storage facility and entomology laboratory (as evaluated in this EA), projects planned in Area B during FY 2008 through FY 2010 include constructing the HPW facility and upgrading the Hilltop District infrastructure for all of the BRAC 2005 missions (as evaluated in a previous EA [CH2M HILL, 2007]), the ITC and the Materials Computation Research Facility, and additions to the AFIT.

Collectively, these projects would comprise approximately 130 acres of land in Area B. Approximately two-thirds of that area is currently open space (95 percent of which is maintained grass areas) and the rest is developed, such as existing roadways, building sites, or parking lots. Upon completion of construction, approximately 25 percent of the development areas would be returned to maintained open grass area (surrounding buildings and parking lots). Thus, there will be a cumulative loss of open space in Area B as a consequence of these developments; however, given their current condition, the cumulative impact to natural resources would not be significant.

The construction of all of these projects will require soil disturbance over most of the area, and potential for soil erosion, during construction activities. As required for the NPDES permits, site-specific SWP3s would be developed for each project. The implementation of erosion control at each site during construction will control the loss of soil from the area.

The cumulative effects of all of these projects on the utilities and traffic in the Area B have been addressed in the BRAC Infrastructure EA (CH2M HILL, 2007). Engineering analyses of the capacity of utility services, including water, wastewater, and natural gas, included the future loads to be generated by the BRAC facilities as well as the other programmed projects, namely the ITC and

AFIT. The BRAC Infrastructure Upgrade Project has been designed to address the cumulative utility needs for all of the proposed projects in Area B. Therefore, no cumulative impact to utilities is expected from these projects.

Similarly, the total traffic generated by all of the BRAC missions, including the HPW, Sensors Directorate, and the other facilities in this EA (the ITC and AFIT), was considered in the engineering analysis of traffic and needed roadway improvements. As discussed in the HPW and Infrastructure EA, the proposed improvements to the internal roads in the Hilltop District, plus the modification of Gate 19B (on National Road), were designed to accommodate the additional expected traffic to the Hilltop District from all of these missions. The proposed improvements are expected to improve internal vehicular and pedestrian traffic flow and inbound traffic flow at Gate 19B over the existing condition.

4.15.2 *Basewide*

Besides Area B, the proposed projects in Area C (RFTS), Kittyhawk (pipeline student dormitory), and the Prairies (Chapel Family Life Center addition), as discussed in this EA, are the primary near term construction projects at the base.

These projects have a modest, cumulative construction footprint of about 10 acres. Like the projects in Area B, the pipeline student dormitory and Chapel Family Life Center addition would occur at sites that have previously been disturbed and are currently maintained lawns. The RFTS project will involve minor removal of woody vegetation, although most of the improvements at that site also will occur on open fields and gravel areas. The implementation of erosion control at each site during construction will control the loss of soil. Cumulatively with the Area B projects, these projects are not expected to have a substantial impact on natural resources.

These other projects constitute minimal additional traffic base wide and are expected to have little or no impact on traffic conditions in their respective areas. These projects also will not exceed the capacity of local utilities.

4.15.3 Regional

Expansive residential and commercial development, with associated roadway and other infrastructure upgrades, also has been occurring in the areas surrounding WPAFB, namely western Greene County and, to a somewhat lesser degree, eastern Montgomery County. While changes at WPAFB, the largest employer in the region, are considered in decisions regarding new land development and infrastructure improvements, these decisions also are made in consideration of other regional socioeconomic indicators. As much of the recent development was in planning or in progress prior to the 2005 BRAC decisions, and its success is dependent on a far greater population than is expected from the new missions, the cumulative impacts of this development cannot be attributed to BRAC or other mission changes at WPAFB.

All of the proposed WPAFB projects would have a substantial positive, cumulative impact on the local and regional economies. The BRAC missions (the HPW and the Sensors Directorate, which also collectively account for all of the projects evaluated in this EA) would comprise the greatest permanent economic impact of the proposed projects in the Hilltop District. In addition to the DoD staff directly related to the BRAC missions (about 1,200 for HPW and 600 for Sensors Directorate), the Dayton Development Coalition (2005) estimates a total of 275 contractors supporting the missions, plus nearly 1,300 indirect positions (non-government, off-base “spin-off” jobs that provide services to workers in direct jobs) will be added to the region. The Coalition estimates the consequent impact to the local economy to be an additional \$100 million (*Dayton Daily News*, 2007). The AFIT campus expansion and renovation also will accommodate additional staff and students. The actual impact of that expansion is uncertain, depending on enrollment, but is expected to be less than the BRAC missions. It is clear from reports by the Dayton Development Coalition and local news media that the regional infrastructure and economy are poised to accommodate the influx of personnel associated with these missions.

The ITC project is a consolidation of existing information technology operations already located at various facilities across the base, and therefore does not represent a permanent impact on the local economy.

4.16 Unavoidable Adverse Effects

The construction of the proposed facilities would require a commitment of soil at each site. Impacts to vegetation would be minor because the species types are common to the base (that is, ordinary vegetation), and the areas excavated would be reseeded and landscaped.

Minor, temporary impacts from noise would slightly affect passersby and nearby workers. The increase in noise primarily would be due to construction and excavation equipment. Construction noise would only exist during working hours and would end at the completion of the operation. A nominal increase in traffic noise may be noticed as each facility is completed due to increased traffic at these sites.

4.17 Relationship of Short-Term Uses and Long-Term Productivity

The Proposed Action addresses the construction of facilities to house several inbound BRAC missions. The 2005 BRAC law directs the movement of these organizations to WPAFB by 2011. Relocation and combining of programs will make the military more efficient, increase operational readiness, and cut costs.

4.18 Irreversible and Irretrievable Commitments of Resources

CEQ regulations in 40 CFR 1502.16 require that an agency identify any irreversible or irretrievable commitments of resources that would be involved in the Proposed Action, should it be implemented. Capital, energy, materials, and labor would be required for the action. These resources are not retrievable.

5 List of Preparers

The following individuals assisted in the preparation of or provided background information for this EA:

| Name/Expertise | Role | Affiliation |
|-----------------------------------------------------------|--------------------------|-------------|
| Teresa Carleton/NEPA Procedures, Biology | Report Preparation | CH2M HILL |
| Suzette Cortina/Project Management | Project Manager | CH2M HILL |
| Marie Chiller/Geology | Report Preparation | CH2M HILL |
| Robert Hook/Utilities, Transportation, Cultural Resources | Report Preparation | CH2M HILL |
| Jessica Jacobs/Air Quality | Report Preparation | CH2M HILL |
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6 List of Persons Contacted

Several persons were contacted or consulted during the preparation of the EA. The persons contacted are listed below:

| Name | Role | Affiliation |
|------------------|-------------------------------------------------|------------------------------------------------------------------------------------------|
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| Sherman Siegal | IRP Manager | 88 ABW/CEVO |
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| Fred Tito | Traffic/Transportation | 88 ABW/CECP |
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List of Persons Contacted
March 2008

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7 References

3D/International, Inc. 1998. Surveys for rare plant and wildlife species within the mad River corridor at Wright-Patterson Air Force Base, Ohio. Unpublished technical report prepared for Wright-Patterson Air Force Base, 88th Air Base Wing, Office of Environmental Management, WPAFB, Ohio.

AMEC Earth and Environmental. 2007. Preliminary Mist Net Study Results for WPAFB, Unpublished. July.

American Conference of Governmental Industrial Hygienists (ACGIH). 2007. Accessed online at <http://www.acgih.org/home.htm>.

American National Standards Institute (ANSI). 1983. ANSI SI.4-1983, Specification for Sound Level Meters, New York.

HE Environmental, Inc. (BHE) and IT Corporation (IT). 1999. *Final Integrated Natural Resources Management Plan, Wright-Patterson Air Force Base, Ohio*.

BHE Environmental, Inc. (BHE). 1999a. Faunal survey of Wright-Patterson Air Force Base with emphasis on rare, threatened, and endangered species. Unpublished technical report prepared for Wright-Patterson Air Force Base, 88th Air Base Wing, Office of Environmental Management, WPAFB, Ohio.

BHE Environmental, Inc. (BHE). 2001. Endangered Species Management Plan for Wright-Patterson Air Force Base, Wright-Patterson Air Force Base, 88th Air Base Wing, Office of Environmental Management, WPAFB, Ohio.

BHE Environmental, Inc. (BHE). 2005. 2005 Update to: Wright-Patterson Air Force Base Wetland Management Plan, 88th Air Base Wing Office of Environmental Management, WPAFB, Ohio.

Birnbaum, Charles A. 1994. *Preservation Brief 36: Protecting Cultural Landscapes: Planning, Treatment, and Management of Historic Landscapes*. National Park Service, Department of the Interior. <http://www.nps.gov/history/hps/tps/briefs/brief36.htm>

CH2M HILL. 1997. *Final Remedial Investigation Report, Operable Unit 8: Spill Site 5, Underground Storage Unit 71A, Spill Site 11, and TCE Contamination at Monitoring Well TFF MW2, Wright-Patterson Air Force Base, Ohio*.

Dayton Daily News. 2007. "Wright-Patterson Air Force Base: Building a Better Base." January 28.

Dayton Development Coalition. 2005. Growing the Dayton Region: 2005 Annual Review for Economic Development. http://www.daytonregion.com/pdf/news/2005_Report.pdf.

Dumouchelle, D. H., C. W. Schalk, G. L. Rowe, and J. T. de Roche. 1993. Hydrogeology, Simulated Ground-Water Flow, and Ground Water Quality, Wright-Patterson Air Force Base, Ohio. U.S. Geological Survey Water Resources Investigation Report 93-4047, U.S. Geological Survey, Columbus.

Earth Tech. 1996. *Phase I Archaeological Investigation of 35 Historical Period Sites, WPAFB, Dayton, Ohio.*

Environmental Quality Management, Inc. 2007. *Facility 200682 Wright Patterson Air Force Base Pre-Demolition Environmental Site Inspection for Asbestos and Hazardous Chemicals.*

Generac Power Systems, Inc. 2004. Technical Perspective: Sound Measurement and Attenuation. Bulletin 0170310SBY. Waukesha, Wisconsin.

International Consultants Incorporated (ICI) and Science Applications International Corporation (SAIC). 1995. *Final Site-Wide Characterization Report, Wright-Patterson Air Force Base Environmental Management 88th Air Base Wing.*

IT Corporation (IT). 1995b. Final Remedial Investigation (RI) Report, Wright-Patterson Air Force Base, Operable Unit 5, Ohio, August.

IT Corporation (IT). 2001. *Final Preliminary Assessment, Building 79/95 Complex, Wright-*

IT Corporation. 1995a. Site-Specific Work Plan for Remedial Design Tasks for the Base-Wide Monitoring Program.

IT Corporation. 1997a. *Final Remedial Investigation Report, Wright-Patterson Air Force Base, Operable Unit 9.*

IT Corporation. 1997b. *Groundwater Flow Modeling Technical Memorandum, Wright-Patterson Air Force Base.*

IT Corporation. 1999. Final Engineering Evaluation/Cost Analysis, Groundwater Basewide Monitoring Program, Wright-Patterson Air Force Base, Evaluation of Remedies for Groundwater Operable Unit, Wright-Patterson Air Force Base, Ohio.

KZF Design and Barge, Waggoner, Sumner and Cannon (KZF/BWSC). 2006. Requirements Document FY 2007 BRAC Site Design and Utilities Infrastructure Upgrade, Wright-Patterson Air Force Base.

KZF Design and Barge, Waggoner, Sumner and Cannon (KZF/BWSC). 2007a. *HPW RFP SI Design Submittal (35% RFP Design of the HPW Complex), Wright-Patterson Air Force Base.*

KZF Design and Barge, Waggoner, Sumner and Cannon (KZF/BWSC). 2007b. *Request For Proposal (RFP) 100% Submittal, Wright-Patterson Air Force Base.*

Metcalf and Eddy. 1996. *Final Remedial Investigation (RI) Report for Operable Unit 6 (Landfills 1 and 2 and Earthfill Disposal Zone 1), Wright-Patterson Air Force Base, Ohio.*

Miami Valley Regional Planning Commission. 2003a. 2003 Traffic Volume Map, East Dayton Area. <http://www.mvrpc.org/tr/trafCount.php>

Miami Valley Regional Planning Commission. 2003b. 2003 Traffic Volume Map, Fairborn Area.

Miami Valley Regional Planning Commission. 2007. State Fiscal Year 2008-2011 Transportation Improvement Program. Final, May, 2007. <http://www.mvrpc.org/tr/tiphome.php>

National Institute for Occupational Safety and Health (NIOSH). 1998. *Criteria for a Recommended Standard: Occupational Noise Exposure—Revised Criteria*, Publication No. 98-126. Available online at <http://www.cdc.gov/niosh/>.

Occupational Safety and Health Administration (OSHA). 2007. OSHA Standards 1910.95, Occupational Noise Exposure; 1926.52, Occupational Noise Exposure; and 1926.101, Hearing Protection.

Ohio Department of Development (ODOD). 2006. Ohio County Profiles. Office of Strategic Research. On-line at <http://www.odod.state.oh.us/research/>. Accessed February and September 2007.

Pacific Environmental Services, Inc. and Metcalf & Eddy (PES/Metcalf & Eddy). 1998. Final Environmental Assessment Cumulative Impacts of Military Training Exercises at the Prime BEEF Area, Wright-Patterson Air Force Base, Ohio. October 26.

Policy Matters Ohio. 2007. International Trade Job Loss. www.policymattersohio.org/InternationalTradeJobLossOhio2007.htm. Accessed February 27.

Shaw Environmental, Inc. 2005. *Final Building 79/95 Complex Site Investigation Report. Wright-Patterson Air Force Base, Ohio.* April.

Shaw Environmental, Inc. 2006. *Final Land Use Control Plan, Wright-Patterson Air Force Base, Ohio.*

U.S. Army Construction Engineering Research Laboratories (USACERL). 1993. *Historic Resources Management Plan for WPAFB, Ohio.* December.

U.S. Army Corps of Engineers (USACE). 2007. *Jurisdictional Determination Form Instructional Guidebook.*

U.S. Bureau of the Census. 2000. 2000 Census Data. On-line at <http://www.census.gov/>. Accessed February and September 2007.

U.S. Department of Agriculture, Soil Conservation Service (USDA SCS). 1976. *Soil Survey of Montgomery County, Ohio.* Produced in cooperation with Ohio Department of Natural Resources and Ohio Agricultural Research and Development Center.

U.S. Department of Agriculture, Soil Conservation Service (USDA SCS). 1978. *Soil Survey of Greene County, Ohio*. Produced in cooperation with Ohio Department of Natural Resources and Ohio Agricultural Research and Development Center.

U.S. Department of Air Force/U.S. Department of Army. 2007. Environmental Assessment Realignment Of Jenkins Armed Forces Reserve Center (AFRC) Kirtland Air Force Base, New Mexico, BRAC 2005. February.

U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers (USACE). 2007. *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States*.

U.S. Fish and Wildlife Service (USFWS). 2005. Clubshell mussel. Accessed online at www.fws.gov/endangered/i/f/saf1b.html, October 17, 2005. Recent listing available at <http://ecos.fws.gov/speciesProfile/SpeciesReport.do?sPCODE=F01D>, March 2008.

Woolpert Consultants. 2001. *Wright-Patterson Air Force Base General Plan, Wright-Patterson Air Force Base, Ohio*.

Wright-Patterson Air Force Base (WPAFB), Environmental Management Division. 2007b. Ohio Historic Inventory Forms for Facilities 20430 and 20683.

Wright-Patterson Air Force Base (WPAFB). 1995. *Air Installation Compatible Use Zone (AICUZ) Study, Wright-Patterson Air Force Base, Ohio*.

Wright-Patterson Air Force Base (WPAFB). 1996. *Record of Decision for 21 No Action Sites, Wright-Patterson Air Force Base, Ohio*.

Wright-Patterson Air Force Base (WPAFB). 1998. *Record of Decision for 41 No Action Sites, Wright-Patterson Air Force Base, Ohio*.

Wright-Patterson Air Force Base (WPAFB). 2005. *Economic Impact Analysis, Wright-Patterson Air Force Base, Ohio*.

Wright-Patterson Air Force Base (WPAFB). 2006a. *Heritage to Horizons, Economic Impact Analysis, Wright-Patterson Air Force Base, Ohio*.

Wright-Patterson Air Force Base (WPAFB). 2006b. *Integrated Cultural Resources Management Plan*. May.

Wright-Patterson Air Force Base (WPAFB). 2006c. Personal communication between Louis Zvakos/WPAFB and Suzette Cortina/CH2M HILL. November 8.

Wright-Patterson Air Force Base (WPAFB). 2006d. "Particulate emissions from WPAFB Fee Emission Report for 2005."

Wright-Patterson Air Force Base (WPAFB). 2007a. *Integrated Natural Resources Management Plan (INRMP) 2007-2011, Wright-Patterson Air Force Base, Ohio*. Final. February.

Wright-Patterson Air Force Base (WPAFB). 2007c. Correspondence from Libby Domingue/WPAFB and CH2M HILL. August.

Wright-Patterson Air Force Base (WPAFB). 2007d. Correspondence from Sherman Siegal/WPAFB and CH2M HILL. November.

Wyle Research Corporation. 1992. Noise Measurement and Assessment Methodologies.

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Figures

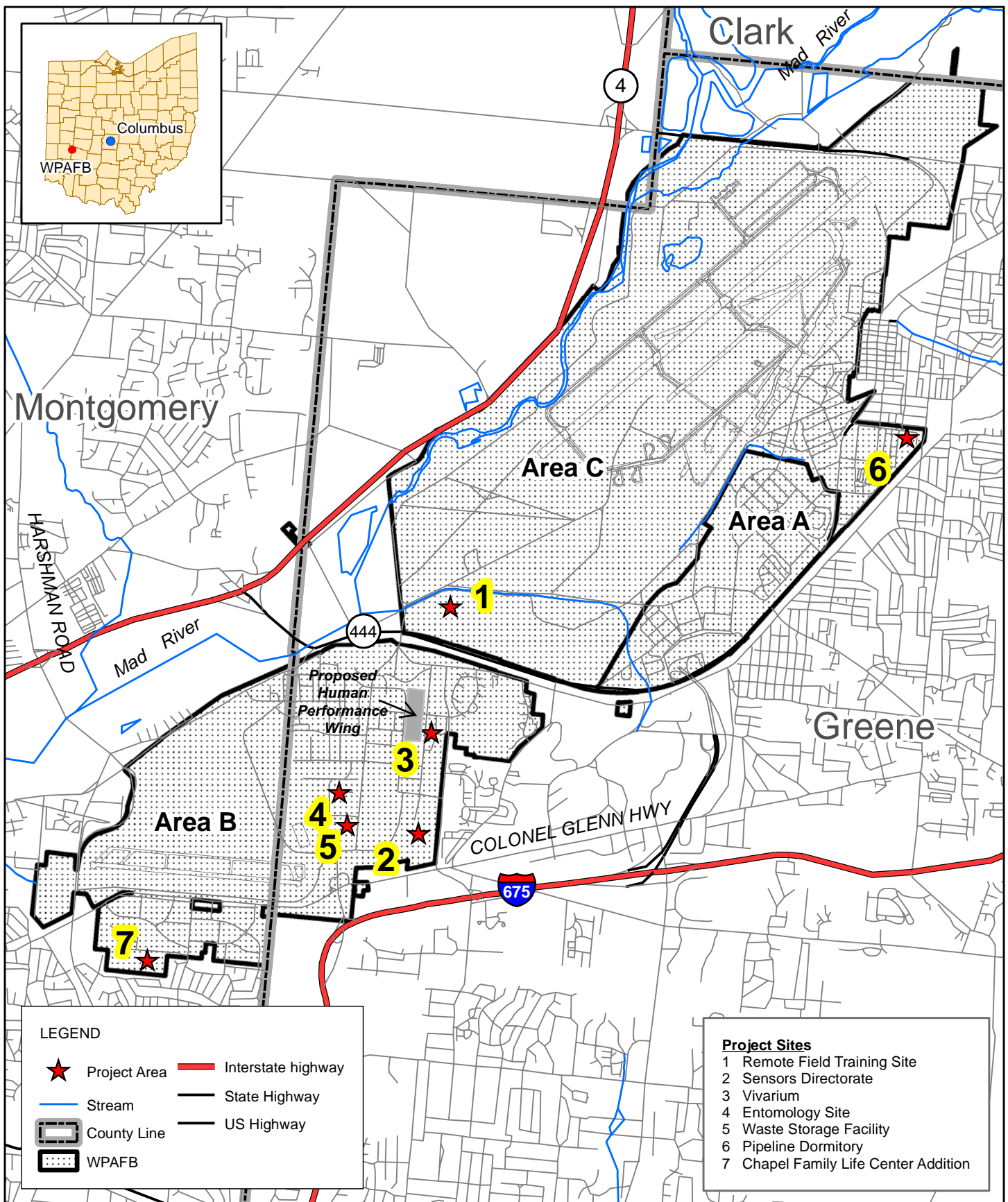


Figure 1
Location of Proposed Projects
BRAC Facilities and Remote Field Training Site EA
Wright-Patterson AFB, OH

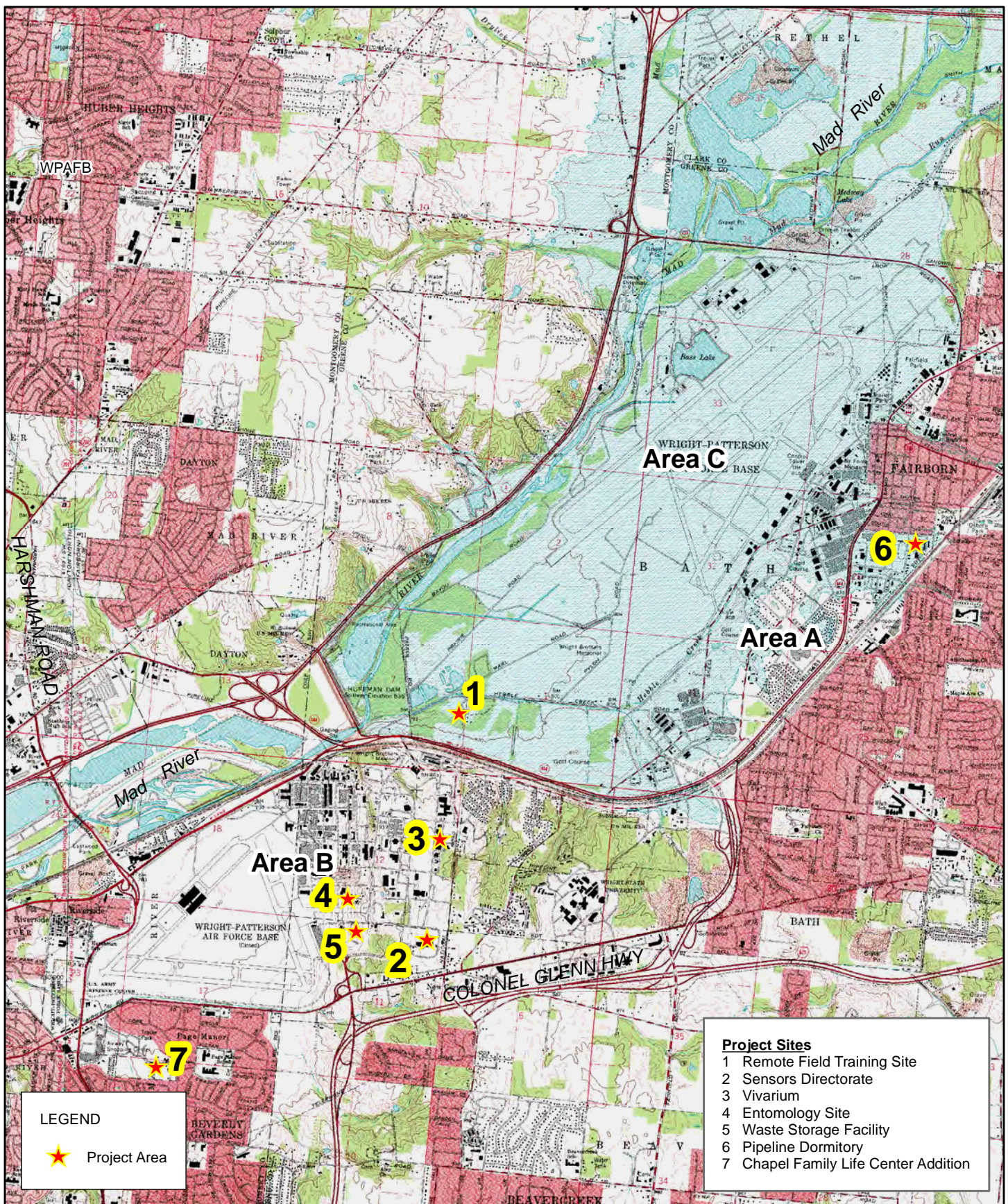


Figure 2
 USGS Topographic Map
 BRAC Facilities and Remote Field Training Site EA
 Wright-Patterson AFB, OH

Figure 3 is available upon request*, contact:

**Environmental Management Division
88 ABW/CEVO
Cultural Resources Manager
Wright-Patterson AFB
(937) 257-0177**

***following confidentiality requirements under Air Force Instruction 32-7065 (1 Jun 04; Section 4.4)
and pertinent authorities protecting cultural resources.**

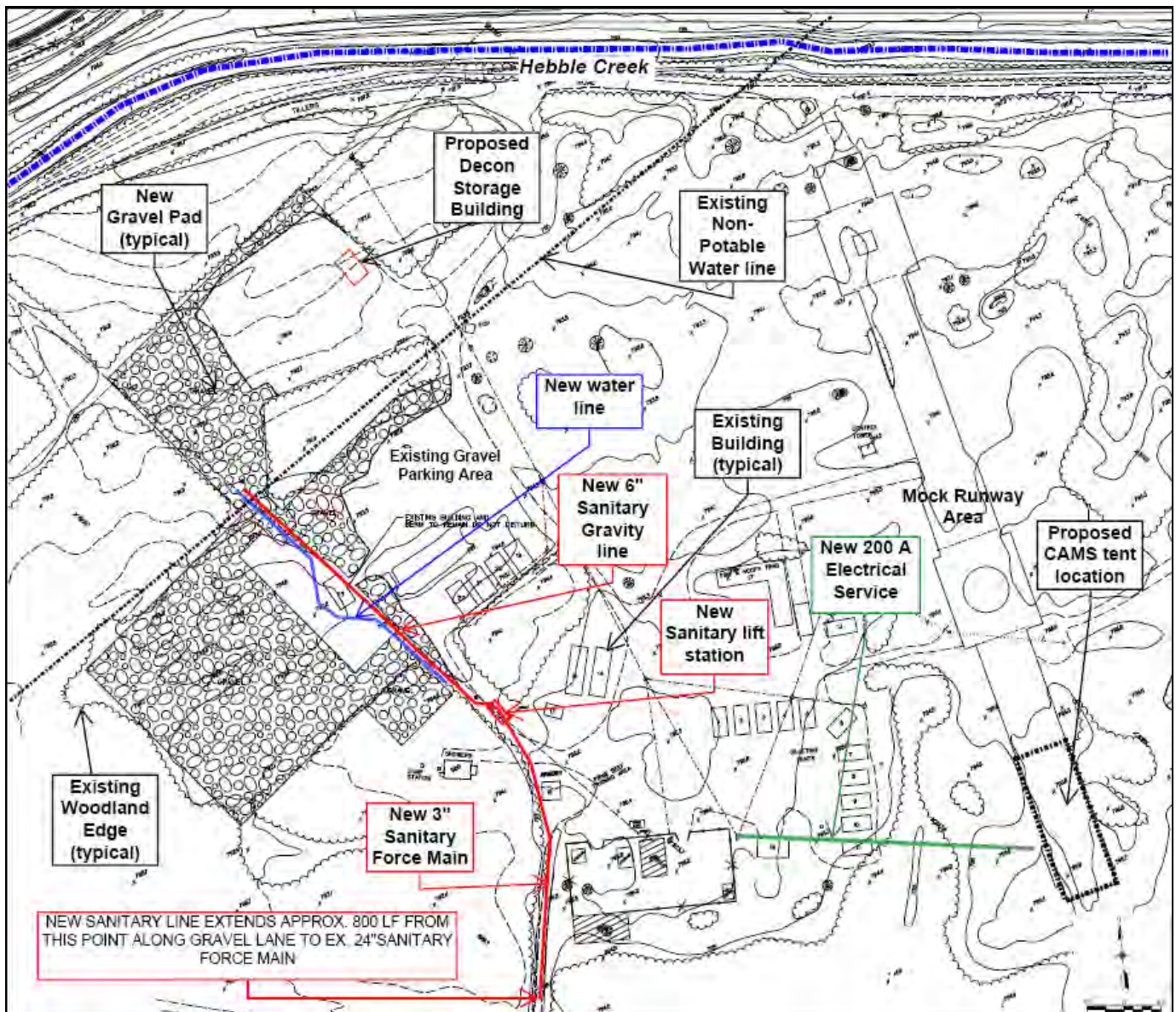


Figure 4

Remote Field Training Site Plan
BRAC Facilities and Remote Field Training Site EA
Wright-Patterson AFB, OH



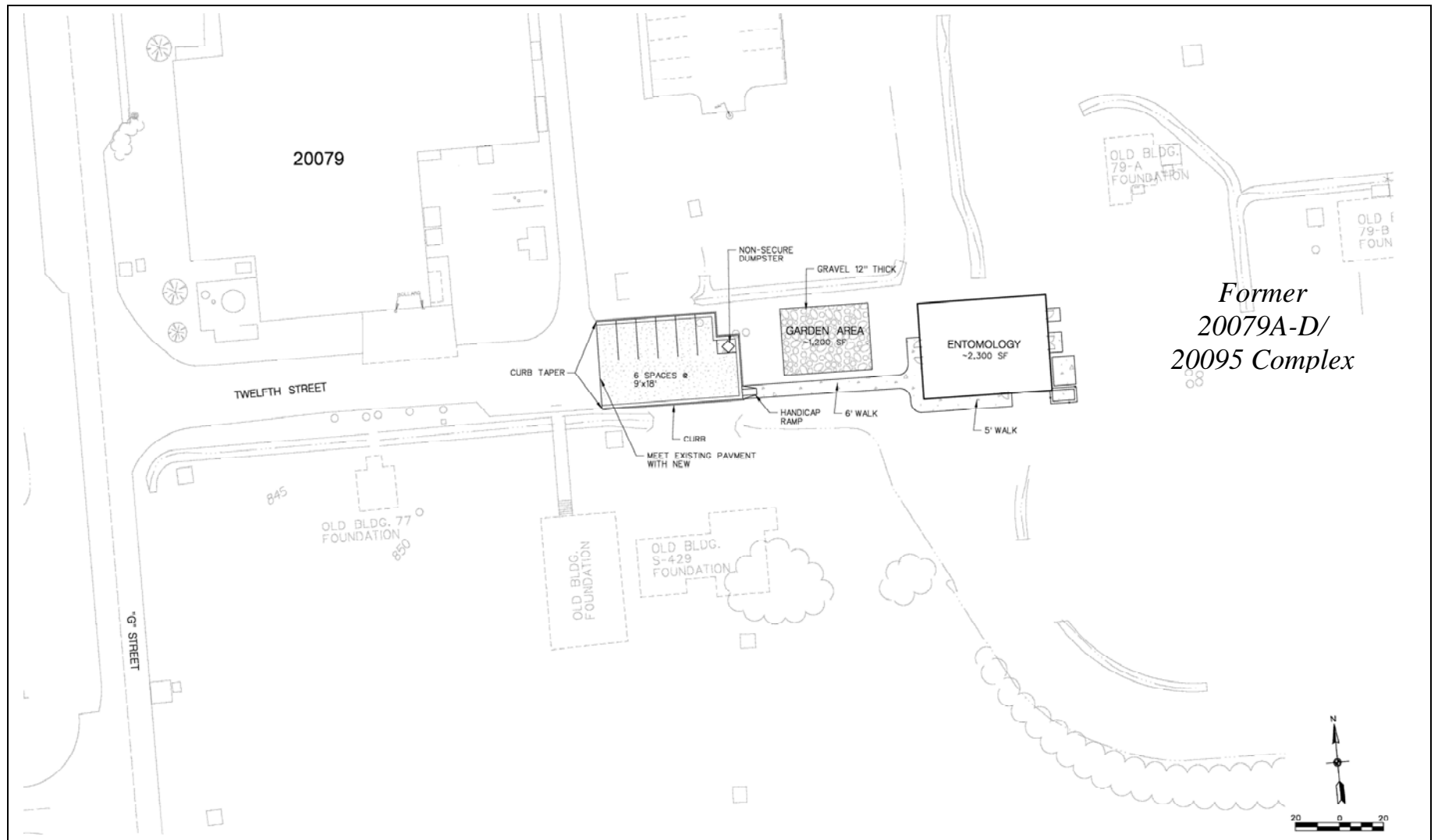
Figure 5
Sensors Directorate
 BRAC Facilities and Remote Field Training Site EA
 Wright-Patterson AFB, OH



Figure 6
Vivarium
 BRAC Facilities and Remote Field Training Site EA
 Wright-Patterson AFB, OH



Figure 7
Entomology Site
 BRAC Facilities and Remote Field Training Site EA
 Wright-Patterson AFB, OH



*Former
20079A-D/
20095 Complex*

Figure 8
Entomology Site Plan
BRAC Facilities and Remote Field Training Site EA
Wright-Patterson AFB, OH



Figure 9
Waste Storage Facility
 BRAC Facilities and Remote Field Training Site EA
 Wright-Patterson AFB, OH



Figure 10
Pipeline Dormitory
 BRAC Facilities and Remote Field Training Site EA
 Wright-Patterson AFB, OH



Figure 11
Chapel Family Life Center Addition
 BRAC Facilities and Remote Field Training Site EA
 Wright-Patterson AFB, OH

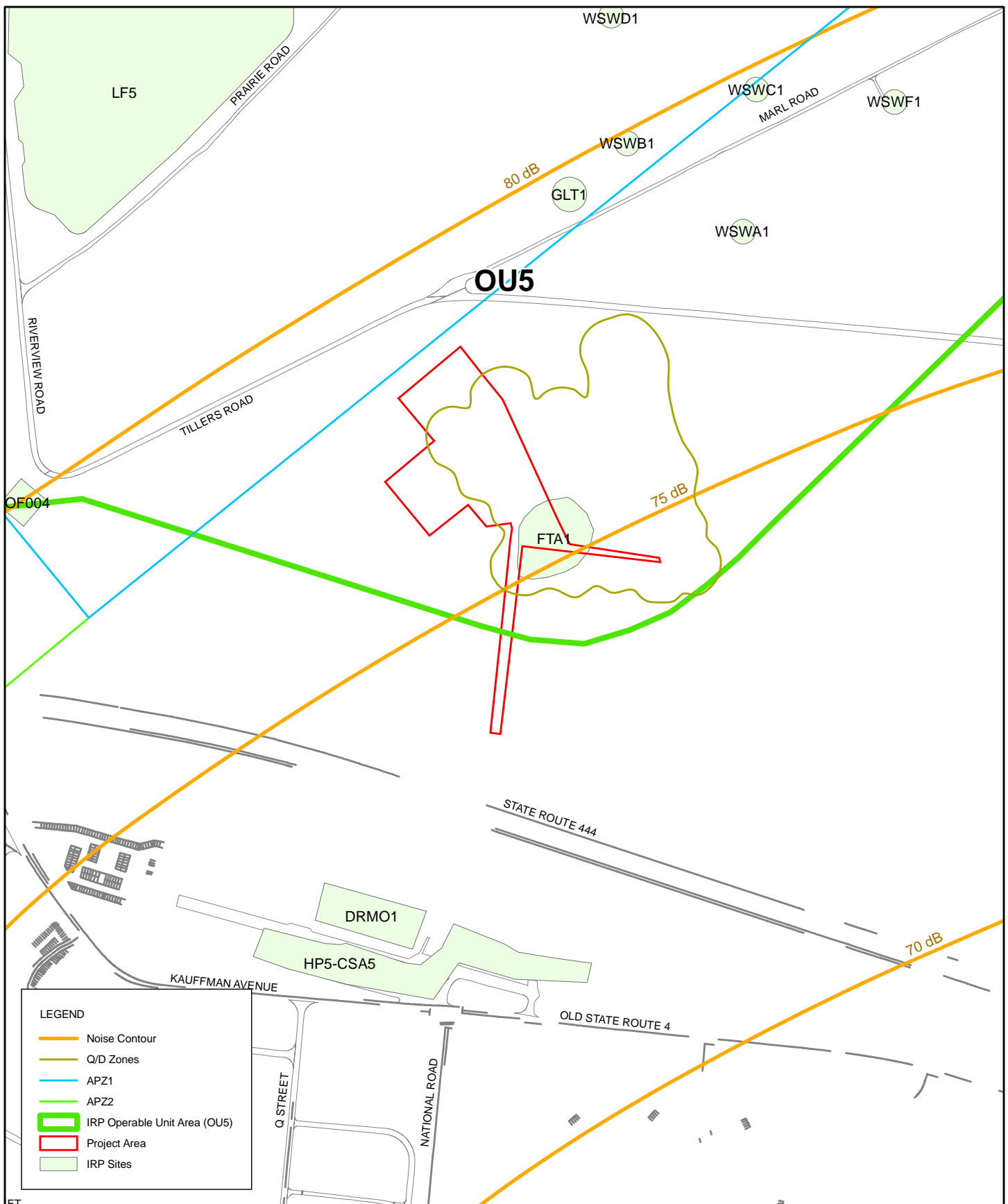


Figure 12
 IRP Sites and Noise Levels Near Remote Field Training Site
 BRAC Facilities and Remote Field Training Site EA
 Wright-Patterson AFB, OH

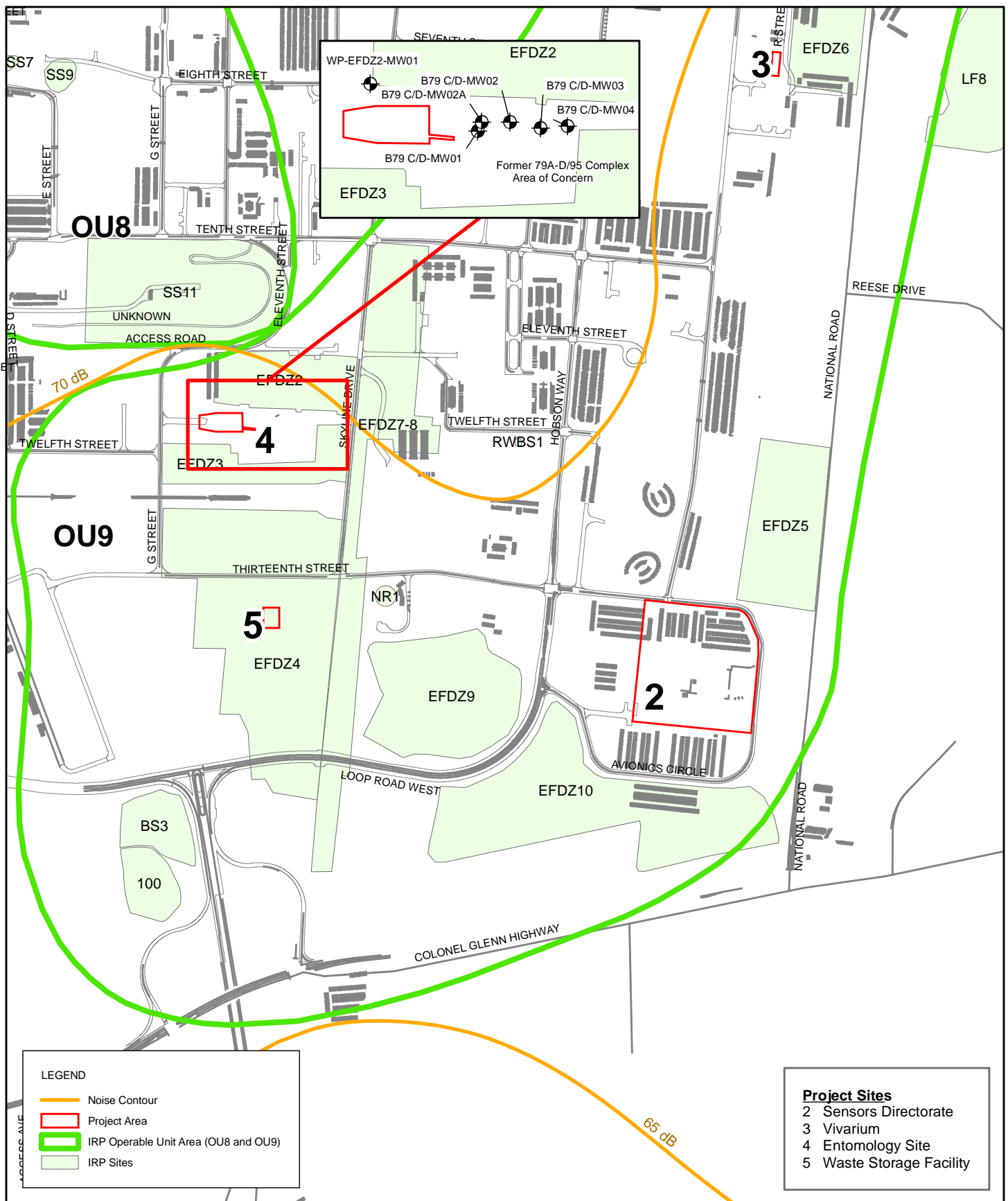


Figure 14 is available upon request*, contact:

**Environmental Management Division
88 ABW/CEVO
Cultural Resources Manager
Wright-Patterson AFB
(937) 257-0177**

***following confidentiality requirements under Air Force Instruction 32-7065 (1 Jun 04; Section 4.4)
and pertinent authorities protecting cultural resources.**

Appendix A
Site Photographs



Key to photos at the Prime BEEF Training Area



1. View of northern portion of Remote Field Training Site project area.



2. View of northern portion of Remote Field Training Site project area.



3. View of southern portion of Remote Field Training Site project area.



4. View of northern portion of Remote Field Training Site project area.



5. Existing gravel parking and building at Prime BEEF Training Area.



6. Existing lane south of developed Prime BEEF Area, where wastewater line would be installed.



7. Existing lane south of developed Prime BEEF Area, where wastewater line would be installed.



8. Existing lane south of developed Prime BEEF Area, where wastewater line would be installed.



9. Area of lane near existing wastewater line manhole, where new line will be tied in.

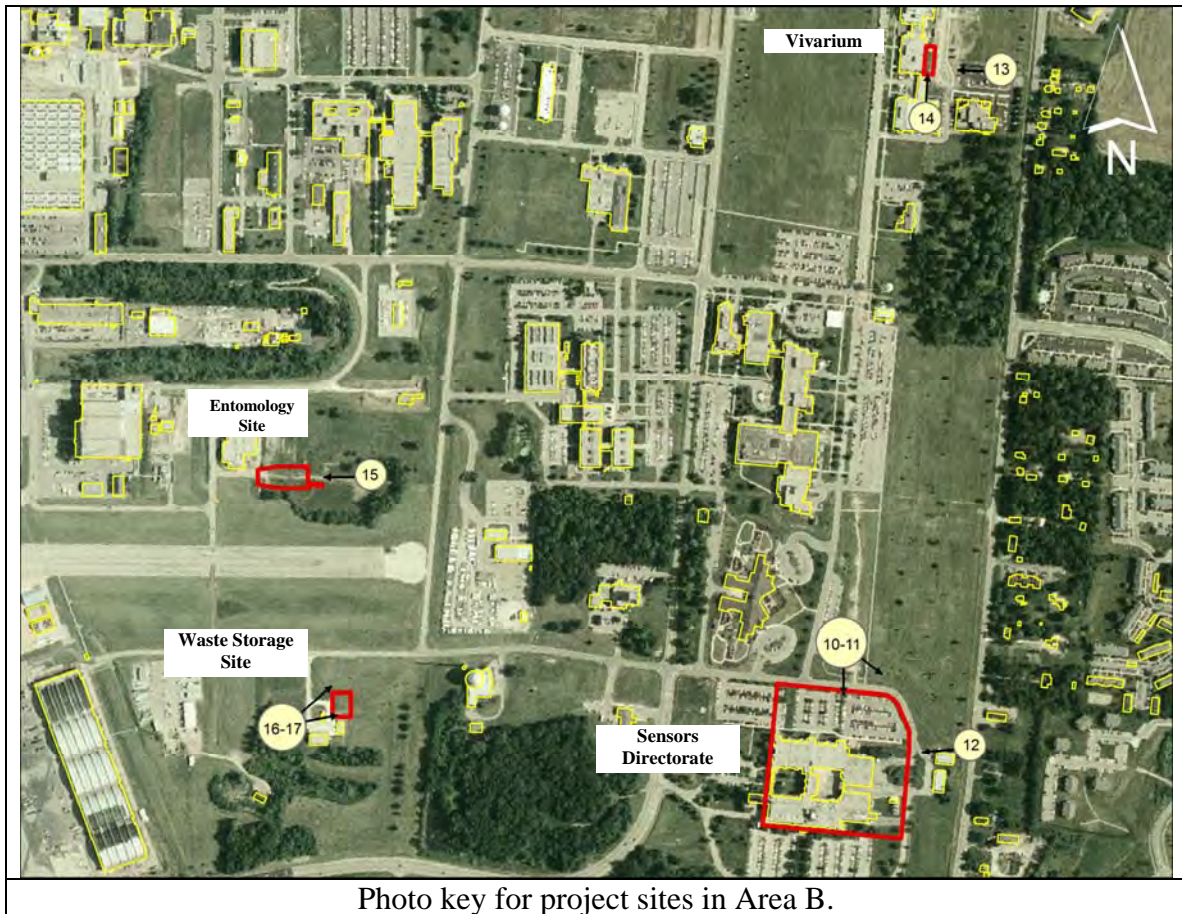


Photo key for project sites in Area B.



10. North side of Facility 20620



11. Area northeast of Facility 20620.



12. Northeast corner of Facility 20620.



13. View west at site of proposed addition to Facility 20838.



14. View north at site of proposed addition to Facility 20838.



15. View of proposed Entomology site, from the east. Unpaved lane extending east from Twelfth Street.



16. View of proposed Waste Storage Facility site, from the southwest, pan photo 1.



17. View of proposed Waste Storage Facility site, from the southwest, pan photo 2.



Photo key for Pipeline Dormitory area.



18. View of Pipeline Dormitory site from northeast at Briar Street.



19. Fir Street along south side of Pipeline Dormitory site.



20. View of Pipeline Dormitory site from southwest.



21. View of Redwood Street along north side of Pipeline Dormitory site.



22. View of Pipeline Dormitory site from northwest, corner of Redwood and Beech Streets.



23. View of Redwood Street along north side of Pipeline Dormitory site.





25. View of the proposed Chapel Life Center Addition site, from the northwest.



26. West side of Chapel Life Center, in area of proposed addition.



27. View of the proposed Chapel Life Center Addition site, from the southwest.



28. Open lawn area between the Chapel Life Center and nearby accompanied housing.

Appendix B
Categorical Exclusion Document for Reuse of
Facilities 20012 and 20017



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 88TH AIR BASE WING (AFMC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

6 August 2007

MEMORANDUM FOR 88 ABW/CECX
ATTN: Anthony Lee


FROM: 88 ABW/CEVO

SUBJECT: AF Form 813 Renovation of Facilities 20012 and 20017

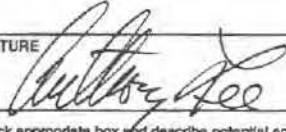
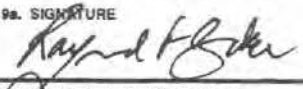
1. The attached AF Form 813 submitted by your office has been processed and approved as described below. There are three potential environmental adverse effects as noted in items 10, 11 and 13 in Section II of the AF Form 813 and described in detail as follows:

- a. Item 10: There is potential workforce exposure to asbestos and lead based paint during renovation and abatement activities. Ensure base specifications 01 02 20, 02 08 10, and 02 09 00 are included in the contract.
- b. Item 11: There is the potential for the generation of asbestos and lead based paint waste during abatement activities. Ensure disposal is performed in accordance with specifications listed above.
- c. Item 13: Facilities 20012 and 20017 are historic buildings, therefore SHPO coordination is required prior to any work being performed. Ensure all design documents are coordinated with 88 ABW/CEV.

2. The proposed action has been assigned categorical exclusion #A2.3.8. A full environmental assessment is not required for this proposed action. If you have any questions, please contact me at 257-0177.


RAYMOND F. BAKER
Operations Branch
Environmental Management Division

Attachment:
AF Form 813

| REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS | | Report Control Symbol RCS: |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-----------------------------------------|
| INSTRUCTIONS: Section 1 to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on Separate sheets as necessary. Reference appropriate item number(s). | | |
| SECTION I - PROPONENT INFORMATION | | |
| 1. TO (Environmental Planning Function) 88ABW/CEVO | 2. FROM (Proponent organization functional address symbol) 88ABW/CECX | 2a. TELEPHONE NO. (937) 656-3459 |
| 3. TITLE OF PROPOSED ACTION Renovate Existing Area B (Wright Field) Bldgs 20012 & 20017 to support Base Realignment and Closure (BRAC) 2005 decisions | | |
| 4. PURPOSE AND NEED FOR ACTION (Identify decision to be made and need date) See Attached | | |
| 5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES (Provide sufficient details for evaluation of the total action.) See Attached | | |
| 6. PROPONENT APPROVAL (Name and Grade) ANTHONY LEE, GS-13 | 6a. SIGNATURE  | 6b. DATE 16-Oct-06 |
| SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. (Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect) | | |
| 7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE (Noise, accident potential, encroachment, etc.) | | + 0 - U |
| 8. AIR QUALITY (Emissions, attainment status, state implementation plan, etc.) | | X |
| 9. WATER RESOURCES (Quality, quantity, source, etc.) | | X |
| 10. SAFETY AND OCCUPATIONAL HEALTH (Asbestos/radiation/chemical exposure/explosives safety quantity-distance, etc.) <i>Potential exposure to asbestos + LBP, follow Site Safety Health Plan</i> | | X |
| 11. HAZARDOUS MATERIALS/WASTE (Use/storage/generation, solid waste, etc.) <i>Potential generation of asbestos + LBP waste.</i> | | X |
| 12. BIOLOGICAL RESOURCES (Wetlands, floodplains, flora, fauna, etc.) | | X |
| 13. CULTURAL RESOURCES (Native American burial sites, archaeological, historical, etc.) <i>Historic bldgs - SHPO Coordination required.</i> | | X |
| 14. GEOLOGY AND SOILS (Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.) | | X |
| 15. SOCIOECONOMIC (Employment/population projections, school and local fiscal impacts, etc.) <i>Positive economic impact to contracted work force.</i> | X | |
| 16. OTHER (Potential impacts not addressed above.) | | |
| SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION | | |
| 17. <input checked="" type="checkbox"/> | PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # A2.3.8 | |
| <input type="checkbox"/> | PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED | |
| 18. REMARKS <i>A2.3.8 Performing interior and exterior construction within the 5-foot line of a building without changing the land use of the existing building.</i> | | |
| 19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (Name and Grade) RAYMOND F. BAKER, YD-02 88ABW/CEVO | 19a. SIGNATURE  | 19b. DATE 6 AUG 07 |

AF FORM 813, AUG 93


(EF-V1)

(PerFORM PRO)

THIS FORM CONSOLIDATES AF FORMS 813 AND 814.

PAGE 1 OF

PAGES

| REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS | | | Report Control Symbol RCS: | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------------|-------------------------------------|
| INSTRUCTIONS: Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s). | | | | |
| SECTION I - PROPONENT INFORMATION | | | | |
| 1. TO (Environmental Planning Function) 88 ABW/CEVO | 2. FROM (Proponent organization and functional address symbol) 88 ABW/CECW | 2a. TELEPHONE NO. (937) 656-3394 | | |
| 3. TITLE OF PROPOSED ACTION Renovate Existing Wright-Patterson AFB Bldgs 20033 and 30002 to support BRAC 2005 decisions | | | | |
| 4. PURPOSE AND NEED FOR ACTION (Identify decision to be made and need date) See Attached Sheet | | | | |
| 5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES (DOPAA) (Provide sufficient details for evaluation of the total action.) See Attached Sheet | | | | |
| 6. PROPONENT APPROVAL (Name and Grade) MICHAEL C. BAUMAN Chief, Wright Field Team, Engineering Division | 6a. SIGNATURE  | | 6b. DATE 1/8/08 | |
| SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. (Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect) | | | + | 0 |
| 7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE (Noise, accident potential, encroachment, etc.) | | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. AIR QUALITY (Emissions, attainment status, state implementation plan, etc.) | | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9. WATER RESOURCES (Quality, quantity, source, etc.) | | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. SAFETY AND OCCUPATIONAL HEALTH (Asbestos/radiation/chemical exposure, explosives safety quantity-distance, bird/wildlife aircraft hazard, etc.) Potential exposure to asbestos & construction hazards | | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11. HAZARDOUS MATERIALS/WASTE (Use/storage/generation, solid waste, etc.) Any generation of hazardous wastes shall comply with WPAFB hazwaste Mgt Plans | | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12. BIOLOGICAL RESOURCES (Wetlands/floodplains, threatened or endangered species, etc.) | | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13. CULTURAL RESOURCES (Native American burial sites, archaeological, historical, etc.) Historic bldgs, however no adverse impacts are anticipated from proposed work | | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 14. GEOLOGY AND SOILS (Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.) | | | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 15. SOCIOECONOMIC (Employment/population projections, school and local fiscal impacts, etc.) Temporary increase in local employment & purchase of goods from construction activities | | | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 16. OTHER (Potential impacts not addressed above.) | | | <input type="checkbox"/> | <input type="checkbox"/> |
| SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION | | | | |
| 17. <input checked="" type="checkbox"/> PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # <u>A2.3.8</u> <input type="checkbox"/> PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED. | | | | |
| 18. REMARKS CATEX A2.3.8 Performing interior and exterior construction within the 5-foot line of a building without changing the land use of the existing building. Ensure asbestos survey is performed in areas of proposed demolition prior to start of work. Coordinate design of project with 88 ABW/CEV. | | | | |
| 19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (Name and Grade) Raymond F. Baker, YD-02 88 ABW/CEVO | 19a. SIGNATURE | | 19b. DATE 8 Jan 2008 | |

4.0 Purpose and Need for Action

- Briefly describe the mission mandate or project objectives (i.e. customers served) that are driving the proposed action:

The purpose of this action is to provide adequate facilities for relocating approximately 1,900 NSF of AFIOH storage space from Brooks City Base, San Antonio TX to Wright-Patterson AFB OH, Bldg 30002 and for relocating approximately 2,127 NSF of lab space from the AFRL Mesa Research Site, Mesa AZ to Wright-Patterson AFB OH, Bldg 20033

- Communicate the sense of Why here? Why now?

This action is needed because available existing facilities must be renovated and reconfigured before they are suitable to accommodate the relocated BRAC Missions. Bldg 30002 is presently used to store Medical WRMs and co-locating the BRAC AFIOH WRM storage requirement together will result in operational efficiencies. The new BRAC AFIOH storage requirement will have be designed to include temperature controls. Bldg 20033 is presently AFRL lab space and moving similar BRAC AFRL Mesa lab space there will create additional operational efficiencies.

- Identify the need date: *Sep 2011*

- Identify related EISs/EAs (if applicable): *Related EAs are underway from the BRAC Facilities and Remote Training Site EA and the recently completed EA for the Human Performance Wing (HPW) BRAC facilities and Infrastructure.*

5.0 Description of Proposed Action

- Identify proposed start date and end date: *Sep 2009 to Sep 2011*

- Identify where action will occur, including maps/drawings: *See attached.*

- Briefly describe the proposed action and alternative(s), including number of people affected by action:

Proposed Action - Renovate Bldgs 20033 and 30002, including interiors, building systems, and moderate demolition work.

Alternative Action 1 - Construct new facilities rather than renovating existing facilities.

No Action Alternative - Leave all existing operations at their current locations.

- If chemicals used, list name and quantity: *This has yet to be determined.*

- If wastes generated, list name and quantity: *This has yet to be determined.*

- List any noise generated, accident potential, or land use: *No impacts are expected.*

- List any impacts to air quality, i.e. are air emissions generated at WPAFB: *Potential temporary impact to air quality is expected during construction.*

- List any impacts to water resources, i.e. drinking water consumed or wastewater generated at WPAFB: *No impacts are expected.*

- List any impacts to ground or soil, i.e. construction, digging, excavating at WPAFB: *No impacts are expected.*

- List any asbestos, radioactive materials, explosives, ordinances, ammunition blanks used at WPAFB: *This has yet to be determined.*

- List quantity of vehicles or equipment brought on-site to WPAFB: *This has yet to be determined.*

- The proponent of this action shall make an effort to ensure compliance with the Affirmative Procurement requirements of Section 6002 of the Resource Conservation and Recovery Act and Executive Order 13101. WPAFB requires the use of recycled and recovered materials and products identified in the EPA's Comprehensive Procurement Guidelines available at the following website: <http://www.epa.gov/cpg/products.htm>. All documents generated as part of this project shall be printed or copied double-sided on recycled paper that meets minimum content standards specified in Section 505 or Executive Order 13101.

- A revised AF Form 813 will be processed for any changes to the work proposed.

Appendix C
Correspondence with the
Ohio Department of Natural Resources



CH2MHILL

CH2M HILL
One South Main Street
Suite 1100
Dayton, Ohio 45402
Tel (937) 228-3180, ext. 267
Fax (937) 228-7572.

October 17, 2006

Debbie Woischke
Ohio Department of Natural Resources
Division of Natural Areas and Preserves
Natural Heritage Data Services
2045 Morse Road, Building F-1
Columbus, Ohio 43229-6693

Subject: Rare Species Data Request and Informal Consultation
Environmental Assessments
Wright Patterson AFB, Base Realignment and Closure Projects
Greene and Montgomery Counties, Ohio

Dear Ms. Woischke:

Wright-Patterson AFB is preparing two Environmental Assessments for several construction projects in support of missions that are being relocated to Wright Patterson AFB from other bases around the nation, as part of the 2005 Base Realignment and Closure (BRAC) recommendations. The sites of these projects are shown on the enclosed maps.

As part of these assessments, we would like to request the locations of known populations of rare, threatened and endangered species within a one mile radius of the project sites. For the Indiana bat, we would like to request information within a five mile radius. A Natural Heritage Data Request form is enclosed. We would also like to request informal consultation regarding the possible impacts of the projects on species listed as threatened or endangered in accordance with Section 7 of the Endangered Species Act.

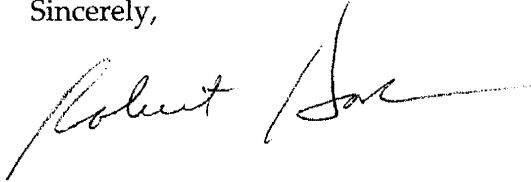
The attached map taken from the Base General Plan identifies the projects. Projects 1, 2 and 3 are the subject of the first Environmental Assessment, and involve infrastructure upgrade projects (i.e., utilities, communications, and roadways). These projects would largely occur along existing roadways.

The remaining projects are the subject of the second Environmental Assessment. Projects 4 through 6, 10 and 13 involve new building construction or additions to existing buildings on primarily open mowed fields/lawns. Projects 7 through 9 are interior renovations of existing structures. Projects 11 and 12 (two alternative sites for one project) involve minor site improvements for mobile medical facility training. The Project 11 site is an unmowed open field with some perimeter woodland, and the Project 12 site is a mowed field with some woodland.

Debbie Woischke
BRAC Environmental Assessments
October 17, 2006

Thank you for your consideration. Please contact me at (937) 228-3180, ext 267 if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert Hook", with a long horizontal flourish extending to the right.

Robert Hook
Project Planner

Copy: Karen Beason (88 ABW/CEVO, WPAFB)

Enclosures: USGS quadrangle map
2004 Aerial Photo map
General Plan, BRAC 2005: General Areas of Proposed Actions and Alternatives



NATURAL HERITAGE DATA REQUEST

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF NATURAL AREAS AND PRESERVES
OHIO NATURAL HERITAGE PROGRAM
2045 MORSE ROAD, BUILDING F-1
COLUMBUS, OHIO 43229
PHONE: 614-265-6453; FAX: 614-267-3096

INSTRUCTIONS:

Please fill out both sides of this data request form, sign it and return it to the address or fax number listed above along with: **(1)** a letter formally requesting data and describing your project, and **(2)** a map detailing the boundaries of your study area. A photocopy from the pertinent portion of a USGS 7.5 minute topographic map is preferred but other maps are acceptable. Our turnaround time is two weeks, although we can often respond more quickly.

FEES:

Fees are determined by the amount of time it takes to complete your project. The charge is \$25.00 per ½ hour with a ½ hour minimum. We can perform a data search manually or by computer. The Heritage Data Services staff will determine the most cost-efficient method of doing your search. A cost estimate can be provided upon request. Unless otherwise specified, an invoice will accompany the data services response.

This request is being submitted by: ☐ fax ☒ mail ☐ both

Date: October 13, 2006

Agency/Organization: CH2M HILL

Name/Title: Robert Hook, Project Planner

Address: One South Main Street, Suite 1100

City/State/Zip: Dayton, Ohio 45402

Phone/Fax: 937-228-3180 ext. 267 (voice) 937-228-7572 (fax)

Project Name/Number: BRAC Environmental Assessments, Wright Patterson AFB

Project is located on the following USGS 7.5 minute topographic map(s): _____

Yellow Springs and Fairborn, OH

If there is a program or contracting agency requiring this information, please give the name and phone number of a contact person:

Karen Beason, Wright Patterson AFB, Environmental Management, (937) 257-5899

The Natural Heritage Data Base contains records for the categories of species and features listed below. Check the appropriate boxes to indicate your selection.

PLANTS: ☐ Federal Status Only
☐ State Legal Status Only
☐ Rare (non-legal status)
☒ All of the above

ANIMALS: ☐ Federal Status Only
☐ State Legal Status Only
☐ Rare (non-legal status)
☒ All of the above

PLANT COMMUNITIES: ☒ All
☐ Wetlands Only
☐ Other _____

OTHER FEATURES: ☐ Geologic Features
☐ Breeding/Non-breeding Animal Concentrations
☐ State Nature Preserves and Natural Areas
☐ State Wild, Scenic and Recreational Rivers
☐ State Parks, Forests, Wildlife Areas
☒ All of the above
☐ Other _____

Besides name, location and status, specify any additional information you need:

The area you want searched: ☐ study area as outlined on the map
☐ study area plus ½ mile radius
☒ study area plus 1 mile radius
☒ other Indiana bat captures within 5 mile radius of project study area

How will the information be used:

The information will be referenced in an Environmental Assessment. Precise locations of any listed species will not be referenced in the documents, but only the distance of the project from the sites, as necessary.

The information supplied above is complete and accurate. Any materials or digital data supplied by the Natural Heritage Database will not be published without prior written permission and without crediting the Division of Natural Areas and Preserves as the source. Electronic data sets may not be distributed to third parties without the written permission of the Division of Natural Areas and Preserves

Signature

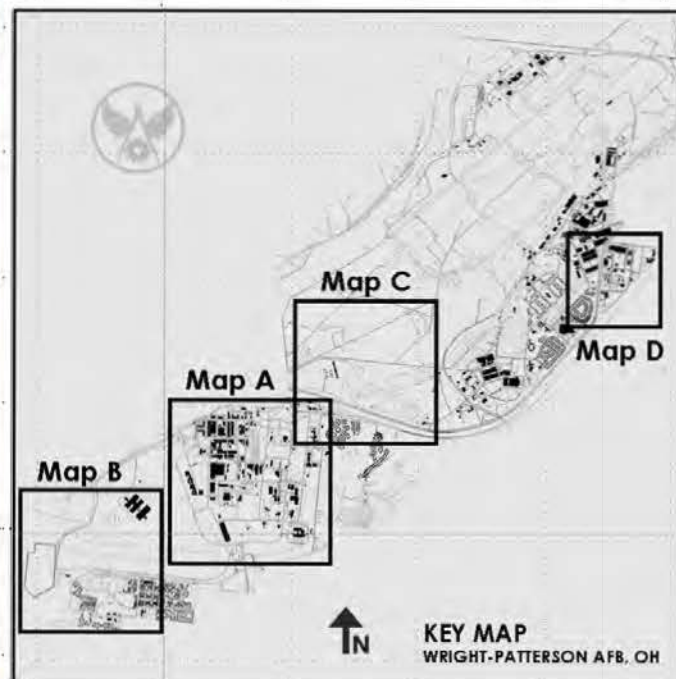
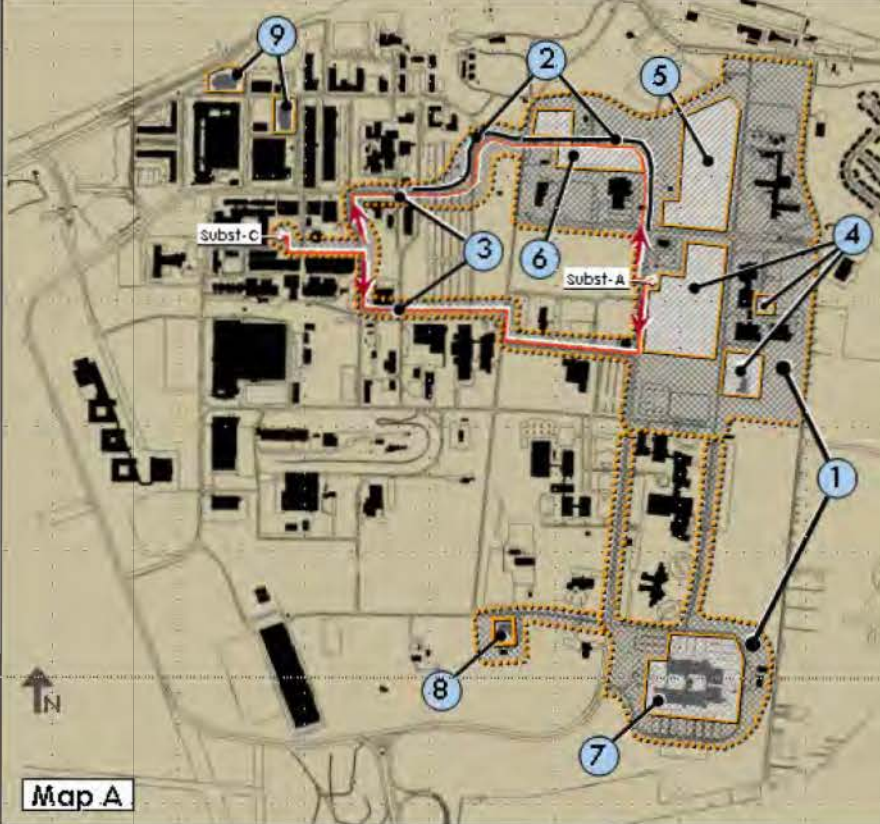






BRAC 2005: GENERAL AREAS OF PROPOSED ACTIONS AND ALTERNATIVES

88ABWCECX WRIGHT - PATTERSON AFB, OHIO

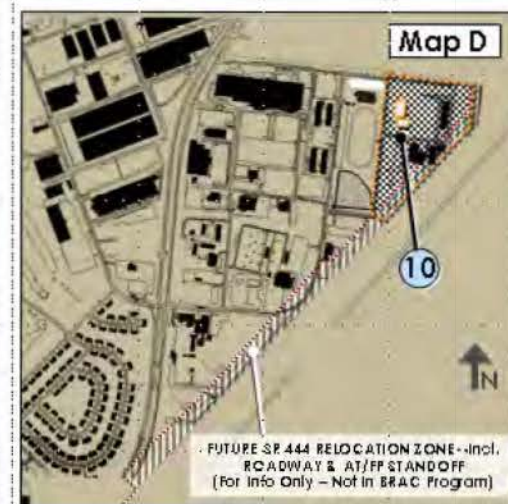
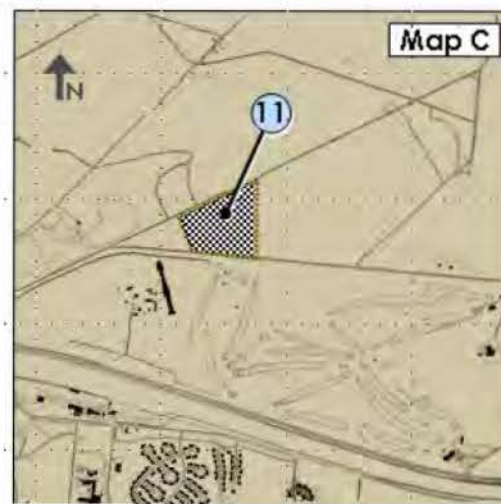
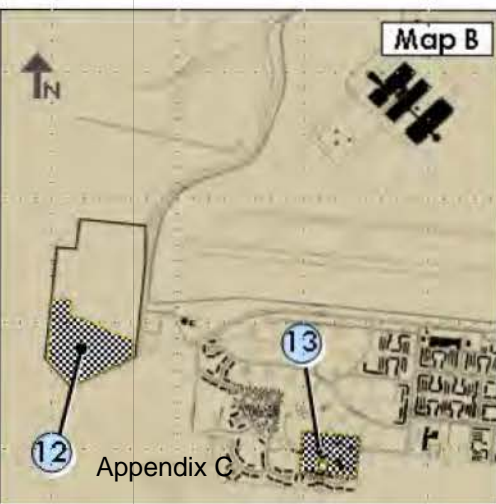


KEY NOTES:

1. Upgrade Area B Utilities/Communications Infrastructure to support BRAC Projects
2. Upgrade Area B Roadways Infrastructure to support BRAC Projects
3. New Underground Tie Circuit between Electrical Substations A and C following either a North or South Connection Route
4. War Fighter Readiness, Biosciences, & Aerospace Medical Research Campus (AFRL/HE & NAMRL)
5. USAF School of Aerospace Medicine & Aerospace Medicine Consultation Campus (USAFSAM)
6. Air Force Institute of Operational Health (AFIOH)
7. Renovate/Expand Bldg 20820 (AFRL/SN)
8. Renovate Bldg 20470/20758 for Alternate Radiation Calibration Facility (AFIOH)
9. Renovate Bldgs 20012 & 20017 (HSG/YA and Fixed Wing Development & Acquisition)
10. Pipeline Student Dorm and Fitness Facility Development Area (USAFSAM)
11. Field Training Site - Alternative 1 (USAFSAM)
12. Field Training Site - Alternative 2 (USAFSAM)
13. Addition to Religious Ed Center, Bldg 20229

LEGEND

- EXISTING FACILITIES
- GENERAL ASSESSMENT AREA FOR BRAC INFRASTRUCTURE UPGRADES
- NEW ROADWAY
- NEW UNDERGROUND ELECTRICAL
- PROPOSED BRAC FACILITY DEVELOPMENT SITES





Ohio Department of Natural Resources

BOB TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR

Division of Natural Areas and Preserves

Bob Gable, Acting Chief

2045 Morse Rd., Bldg. F-1

Columbus, OH 43229-6693

Phone: (614) 265-6453; Fax: (614) 267-3096

October 19, 2006

Robert Hook
CH2M Hill
One S. Main St., Suite 1100
Dayton, OH 45402

Dear Mr. Hook:

I have reviewed our Natural Heritage maps and files for the Wright Patterson Air Force Base Realignment and Closures project areas, including a one mile radius, in Mad River Township, Montgomery County and in Beaver Creek and Bath Townships, Greene County, and on the Yellow Springs and Fairborn Quads. I also performed a search for Indiana Bat (*Myotis sodalis*) records within a five mile radius of the project areas. The numbers/letters on the list below correspond to the areas marked on the accompanying map. Common name, scientific name and status are given for each species.

Yellow Springs/Fairborn Quads

- A. Huffman Metro Park - Five Rivers MetroParks (4 parcels)
- B. Dayton Aviation Heritage National Historical Park - National Park Service
- C. Cemex Reserve - Greene Co. Park District
- 1. *Bartramia longicauda* - Upland Sandpiper, threatened
- 2. *Carex mesochorea* - Midland Sedge, threatened
- 3. *Myotis sodalis* - Indiana Bat, state endangered, federal endangered
- 4. *Myotis sodalis* - Indiana Bat, state endangered, federal endangered
- 5. *Cistothorus platensis* - Sedge Wren, species of concern
- Papaipema beeriana* - Beer's Noctuid, endangered
- 6. *Sistrurus catenatus* - Eastern Massasauga, endangered
- 7. *Sistrurus catenatus* - Eastern Massasauga, endangered
- 8. *Sistrurus catenatus* - Eastern Massasauga, endangered
- 9. *Vitis cinerea* - Pigeon Grape, potentially threatened
- 10. *Vitis cinerea* - Pigeon Grape, potentially threatened

There are no state nature preserves or scenic rivers at the project site. We are also unaware of any geologic features, breeding or non-breeding animal concentrations or state parks, forests or wildlife areas in the project vicinity.

Robert Hook
October 19, 2006
Page 2

Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Please note that although we inventory all types of plant communities, we only maintain records on the highest quality areas. Also, we do not have data for all Ohio wetlands. For National Wetlands Inventory maps, please contact Madge Fitak in the Division of Geological Survey at 614-265-6576.

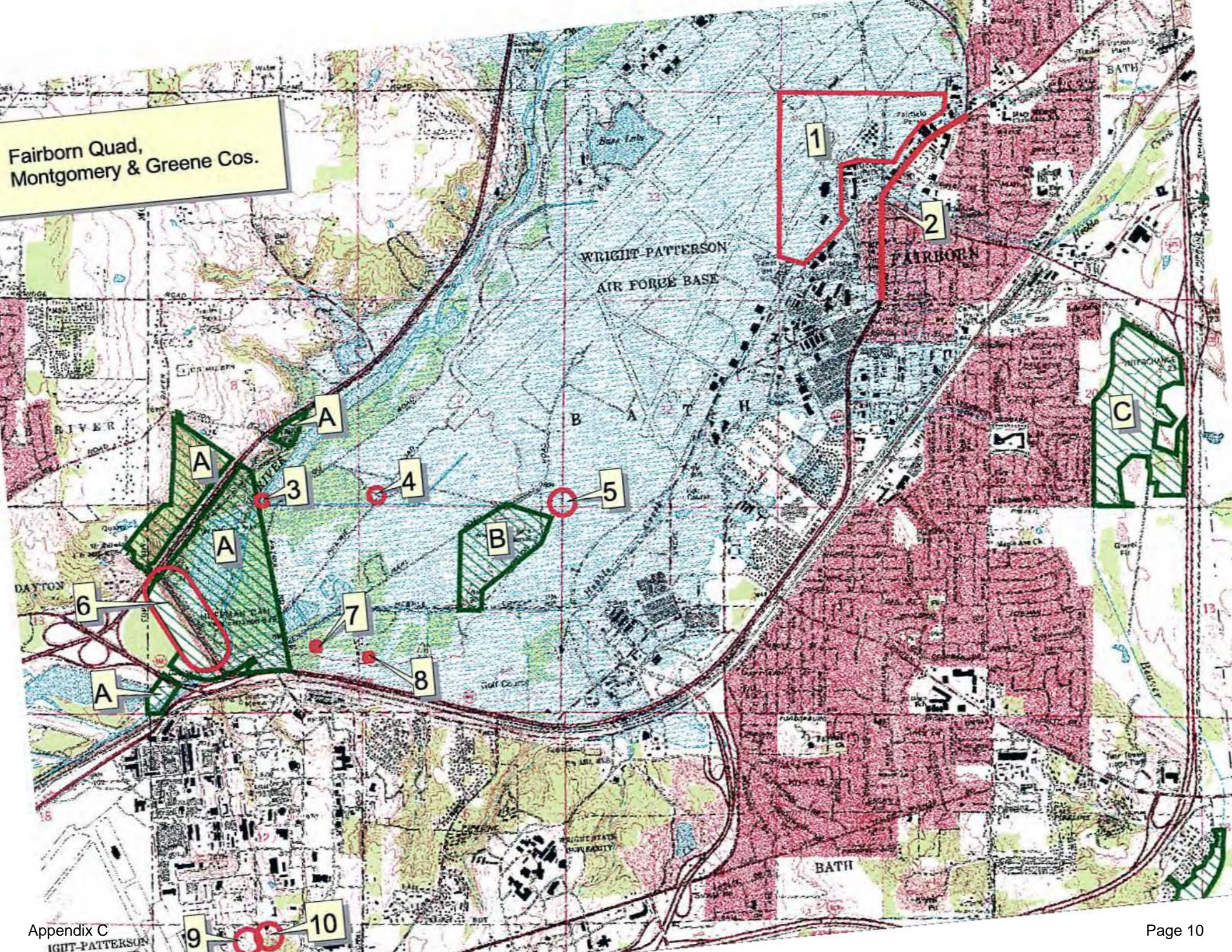
Please contact me at 614-265-6818 if I can be of further assistance.

Sincerely,

A handwritten signature in blue ink that reads "Debbie Woischke". The signature is written in a cursive, flowing style.

Debbie Woischke, Ecological Analyst
Natural Heritage Program

Fairborn Quad,
Montgomery & Greene Cos.



Appendix D
Correspondence with the
U.S. Fish & Wildlife Service



DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 88TH AIR BASE WING (AFMC)

WRIGHT-PATTERSON AIR FORCE BASE, OHIO

27 November 2006

88 ABW/CEVO Bldg 89
5490 Pearson Road
Wright-Patterson AFB OH 45433-5332

Dr. Mary Knapp
U.S. Fish and Wildlife Service
6950 Americana Pkwy
Suite H
Reynoldsburg, OH 43068-4127

Dear Dr. Knapp

The U.S. Air Force is seeking informal consultation with the U.S. Fish and Wildlife Service in compliance with Section 7 of the Endangered Species Act in support of multiple mission activities relocating to Wright-Patterson Air Force Base (WPAFB) as part of the Base Realignment and Closure (BRAC) 2005 decisions. WPAFB is currently preparing two Environmental Assessments (EAs) in support of the mission relocations. The proposed locations for these projects are shown on the attached maps.

The first assessment will address upgrading the Area B infrastructure providing adequate site utilities, communications, and roadways that will support multiple mission activities relocating WPAFB (Sites 1, 2, and 3 on attached map). The upgrades would largely occur along existing roadways.

A second assessment will address plans to construct new facilities, renovate existing facilities and evaluate locations associated with support functions for the multiple mission activities relocating to WPAFB from other bases around the nation. Site locations 4 through 6, 10 and 13 involve new building construction or additions to existing buildings on primarily open mowed fields/lawns. Sites 7 through 9 are interior renovations of existing structures. Sites 11 and 12 (two alternative sites for one project) involve minor site improvements for mobile medical facility training. Site 11 is an unmowed open field with some perimeter woodland, and site 12 is a mowed field with some woodland.

Thank you for your consideration. Please contact me at (937) 257-5899 or by email at karen.beason@wpafb.af.mil if you have any questions.

Sincerely

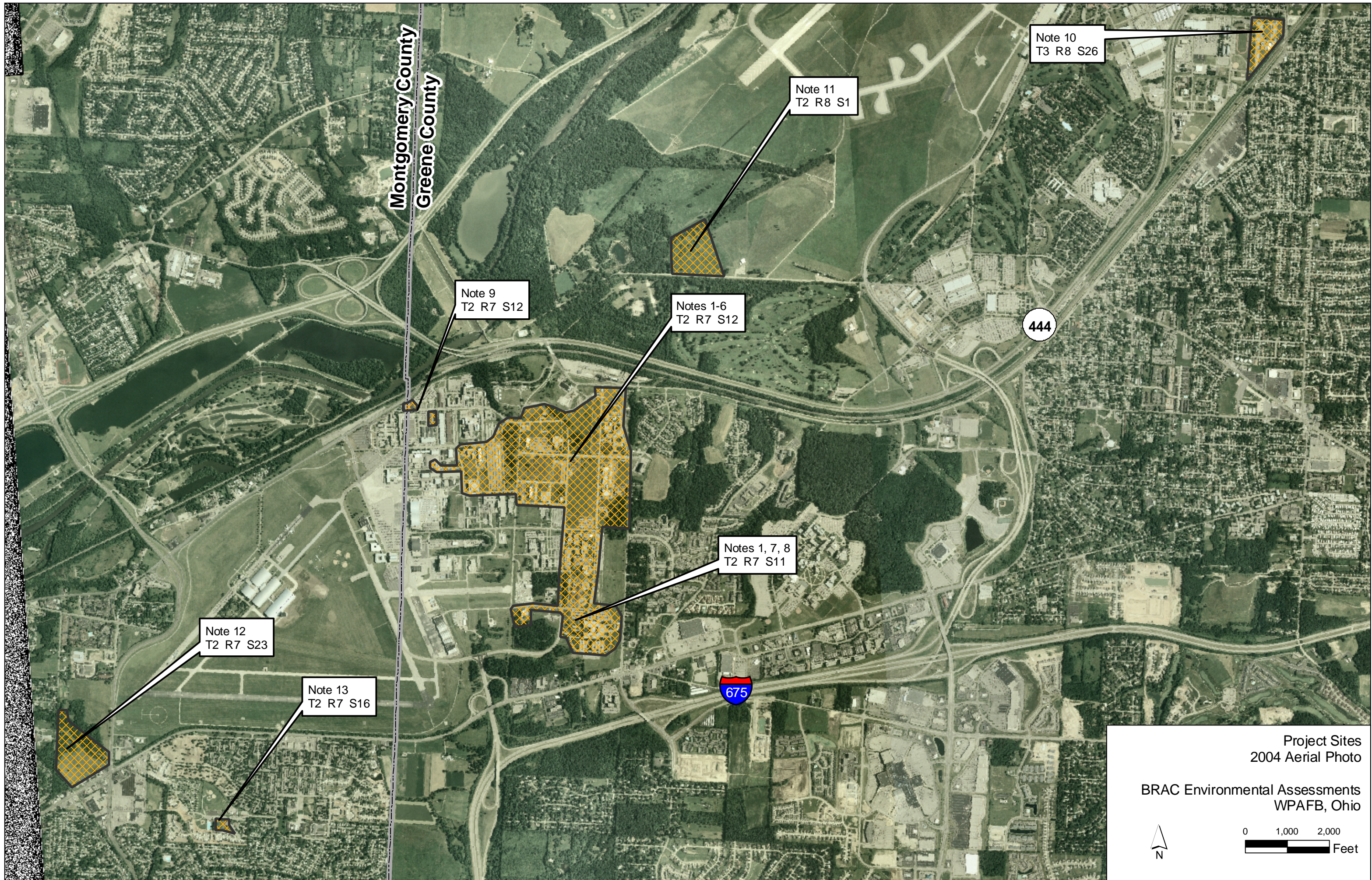

Karen N. Beason

Operations Branch
Environmental Management Division

cc: Suzette Cortina/CH2M HILL

Attachments:

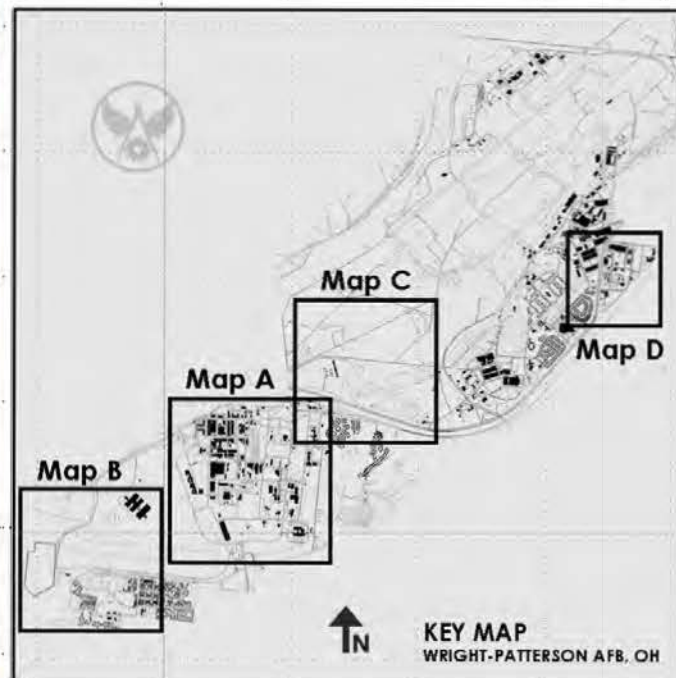
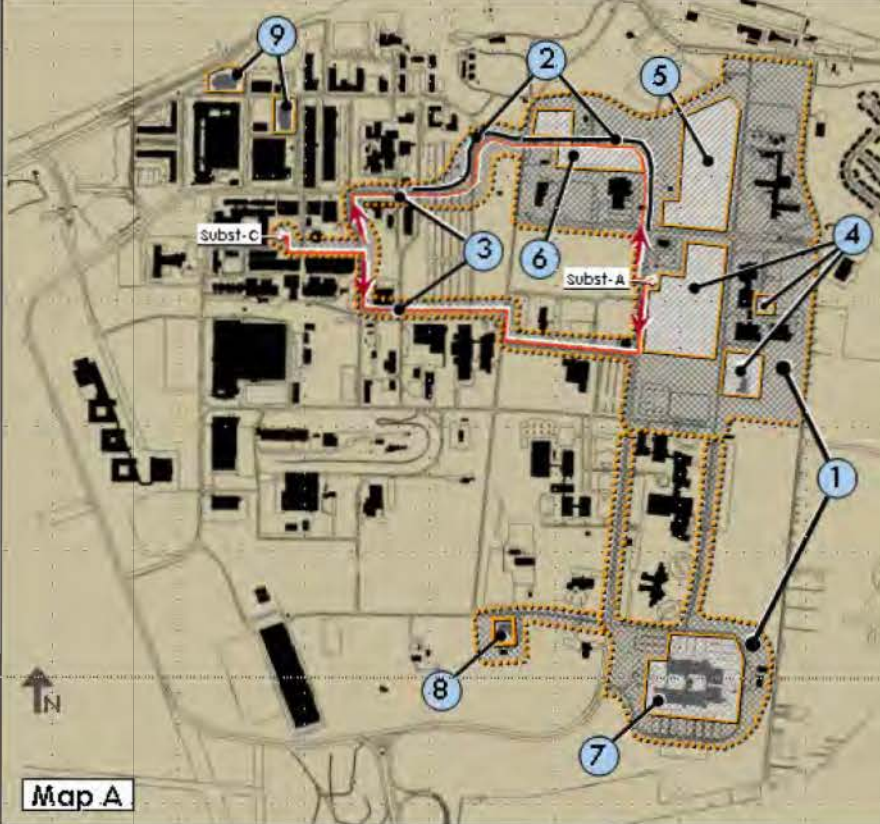
1. USGS Quadrangle Map
2. 2004 Aerial Photo Map
3. General Areas of Proposed Actions and Alternatives





BRAC 2005: GENERAL AREAS OF PROPOSED ACTIONS AND ALTERNATIVES

88ABWCECX WRIGHT - PATTERSON AFB, OHIO

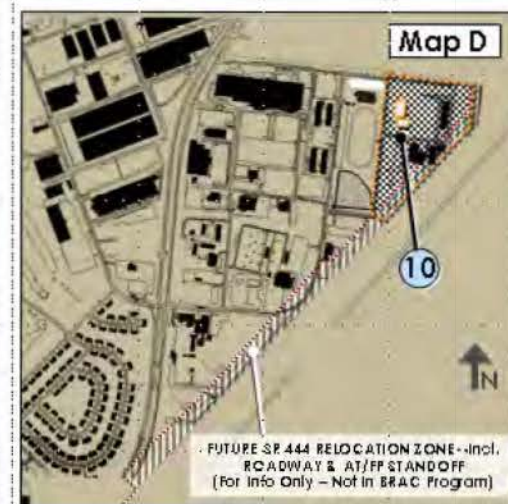
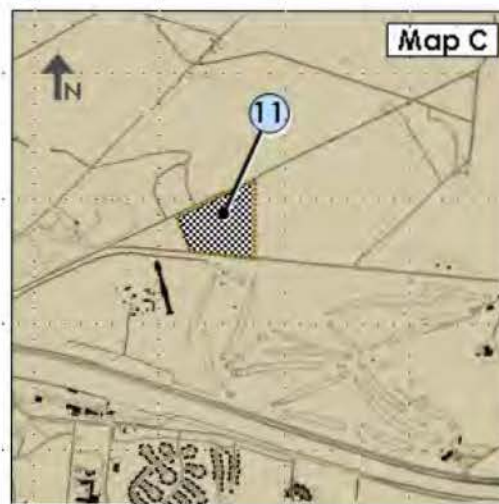
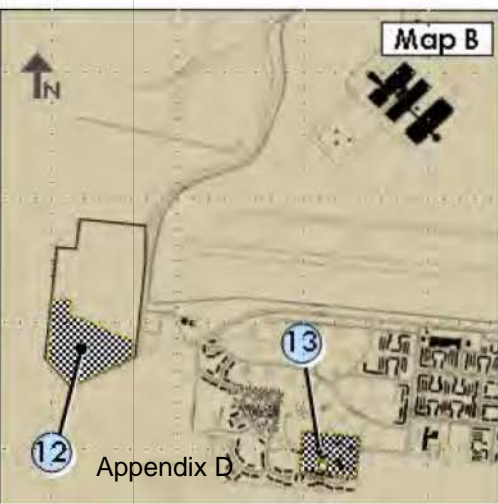


KEY NOTES:

1. Upgrade Area B Utilities/Communications Infrastructure to support BRAC Projects
2. Upgrade Area B Roadways Infrastructure to support BRAC Projects
3. New Underground Tie Circuit between Electrical Substations A and C following either a North or South Connection Route
4. War Fighter Readiness, Biosciences, & Aerospace Medical Research Campus (AFRL/HE & NAMRL)
5. USAF School of Aerospace Medicine & Aerospace Medicine Consultation Campus (USAFSAM)
6. Air Force Institute of Operational Health (AFIOH)
7. Renovate/Expand Bldg 20820 (AFRL/SN)
8. Renovate Bldg 20470/20758 for Alternate Radiation Calibration Facility (AFIOH)
9. Renovate Bldgs 20012 & 20017 (HSG/YA and Fixed Wing Development & Acquisition)
10. Pipeline Student Dorm and Fitness Facility Development Area (USAFSAM)
11. Field Training Site - Alternative 1 (USAFSAM)
12. Field Training Site - Alternative 2 (USAFSAM)
13. Addition to Religious Ed Center, Bldg 20229

LEGEND

- EXISTING FACILITIES
- GENERAL ASSESSMENT AREA FOR BRAC INFRASTRUCTURE UPGRADES
- NEW ROADWAY
- NEW UNDERGROUND ELECTRICAL
- PROPOSED BRAC FACILITY DEVELOPMENT SITES





United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services

6950 Americana Parkway, Suite H

Reynoldsburg, Ohio 43068-4127

(614) 469-6923/FAX (614) 469-6919

January 23, 2007

Karen Beason
88 ABW/CEVO Bldg 89
5490 Pearson Road
Wight-Patterson AFB, OH 45433

TAILS: 31420-2007-I-0089

Dear Ms. Beason,

The U.S. Fish and Wildlife Service (Service) has reviewed your November 27, 2006 letter regarding preparation of two Environmental Assessments in support of mission activities relocating at Wright-Patterson Air Force Base (WPAFB) in Montgomery and Greene Counties, Ohio. The first assessment will address upgrading infrastructure and will occur largely along existing roadways. The second assessment includes plans for new construction and may occur in undeveloped areas (unmowed fields and woodlands).

Through the INRMP process it was determined that four federally listed species may occur at WPAFB. These species include the Indiana bat (*Myotis sodalis*), bald eagle (*Haliaeetus leucocephalus*), clubshell mussel (*Pleurobema clava*), and Eastern massasauga (*Sistrurus catenatus*). Based on the information provided in your letter, the Indiana bat and Eastern massasauga may be affected. Below is information about each of these species.

The proposed project lies within the range of the **Indiana bat**, a Federally-listed endangered species. Known locations for this species occur within your project area. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. Summer habitat requirements for the species are not well defined but the following are considered important:

1. Dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas.
2. Live trees (such as shagbark hickory and oaks) which have exfoliating bark.
3. Stream corridors, riparian areas, and upland woodlots which provide forage sites.

The Service recommends that project designs maintain as many trees and forested habitat shrub/scrub habitat as possible along all property lines and along edges of developed areas by minimizing footprint of graded areas, roads, and staging areas to the maximum extent practicable. Should the proposed site contain trees or associated habitats exhibiting any of the characteristics listed above, we recommend that the habitat and surrounding trees be saved wherever possible. If

the trees must be cut, further coordination with this office is requested to determine if surveys are warranted. Any survey should be designed and conducted in coordination with the Endangered Species Coordinator for this office.

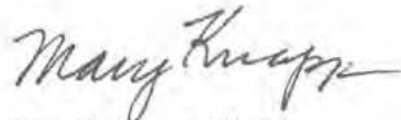
The project lies within the range of the **eastern massasauga**, a docile rattlesnake that is declining throughout its national range and is currently a Federal Candidate species. The snake is currently listed as endangered by the State of Ohio. Your proactive efforts to conserve this species now may help avoid the need to list the species under the Endangered Species Act in the future. Due to their reclusive nature, we encourage early project coordination to avoid potential impacts to massasaugas and their habitat. At a minimum, project evaluations should contain delineations of whether or not massasauga habitat occurs within project boundaries. The massasauga is often found in or near wet areas, including wetlands, wet prairie, or nearby woodland or shrub edge habitat. This often includes dry goldenrod meadows with a mosaic of early successional woody species such as dogwood or multiflora rose. Wet habitat and nearby dry edges are utilized by the snakes, especially during the spring and fall. Dry upland areas up to 1.5 miles away are utilized during the summer, if available. For additional information on the eastern massasauga, including project management ideas, please visit the following website:
<http://www.fws.gov/midwest/Endangered/lists/candidat.html> or contact this office directly.

The proposed project also lies within the range of the **bald eagle** and **clubshell mussel**. Due to the lack of suitable habitat, no impacts to these threatened and endangered species are anticipated. Relative to these two species, this concludes consultation on this action as required by section 7(a)(2) of the Endangered Species Act. Should, during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the Service should be reinitiated to assess whether the determinations are still valid.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973, as amended, and are consistent with the intent of the National Environmental Policy Act of 1969 and the U. S. Fish and Wildlife Service's Mitigation Policy. Please note that consultation under section 7 of the ESA may be warranted for this project if suitable habitat for the Indiana bat may be impacted by this project. This letter provides technical assistance only and does not serve as a completed section 7 consultation document.

If you have questions, or if we may be of further assistance in this matter, please contact Sarena Selbo at extension 17 in this office.

Sincerely,



Mary M. Knapp, Ph.D.
Supervisor

cc: ODNR, Div. of Wildlife, SCEA Unit, Columbus, Ohio



DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 88TH AIR BASE WING (AFMC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

21 December 2007

88 ABW/CEVO, Bldg 89
5490 Pearson Road
Wright-Patterson AFB OH 45433-5332

Dr. Mary Knapp
U.S. Fish and Wildlife Service (USFWS)
6950 Americana Pkwy
Suite H
Reynoldsburg, OH 43068-4127

Dear Dr. Knapp

Wright-Patterson Air Force Base is preparing an Environmental Assessment (EA) for several construction projects in support of missions that are relocating to the base from other military installations around the nation as part of the 2005 Base Realignment and Closure (BRAC) decision. A new preferred location for the proposed Remote Field Training Site (RFTS) was added to the project after the initial consultation with your office in November 2006. As part of this EA, WPAFB proposes to make minor improvements to the new proposed location, the Prime BEEF (Base Engineer Emergency Force) Training Area. WPAFB requests further informal consultation regarding the possible impacts of the project on species listed as threatened or endangered in accordance with Section 7 of the Endangered Species Act.

The Prime Beef Training Area (PBTA) covers approximately 93 acres in the southwest corner of Area C. It is the only area on WPAFB currently used for military training and readiness exercises. The PBTA contains barracks, storage facilities, a mock runway, gravel roads, parking areas, and a latrine. Training conducted in the PBTA includes battlefield civil exercises, medical evacuation activities, use of pyrotechnics and weapons simulators, and heavy equipment training (Humvees, ATV type vehicles, ambulances and fork lifts). All training is conducted in a controlled environment and upon completion of each exercise; the PBTA is restored to its original condition.

Training exercises simulate deployments for periods of a few hours to several weeks. During course week, the students will bed down at the PBTA for the duration of the course. There will be loud noise from time to time from the use of sound systems within a tent structure for disorientation as well as a "giant voice" to relay messages to the trainees. The loud noises would be during the hours of daylight to dusk, but not expected during the night time hours. There will be some lighting during hours of darkness provided by light alls and flood lights to allow students to traverse the compound safely.

Attachment 1 illustrates the general location of the PBTA. Attachments 2 and 3 illustrate the new proposed project area layout, which would include laying of gravel in areas already disturbed for temporary tents and storage. In addition, minor clearing of vegetation (primarily shrubs) may be required immediately adjacent to the disturbed areas for installation of a sewer line. Other improvements may include concrete or gravel pads for parking vehicles or equipment. The only permanent structure proposed is a non-habitable storage shed outlined in red on attachment 3.

The woodlands of the PBTA are considered to be low to moderate quality for roosting habitat for the Indiana bat. Recent surveys for the bat found no roost trees in the PBTA, but the bats are known to forage in the area, particularly along Hebble Creek (attachment 4). The preferred location will not remove any trees that are suitable as roosting habitats. No impact will occur in the woodlands along Hebble Creek.

The eastern massasauga rattlesnake is a federal candidate species usually found in wet areas including wet prairies, marshes, and low-lying areas. Neither the historical nor current population status of the massasauga rattlesnake at WPAFB has been determined. Based on historical sightings, the entire PBTA is considered primary habitat for the eastern massasauga rattlesnake. Because this rattlesnake is a federal candidate species, WPAFB has adopted the following measures to minimize potential impacts to the eastern massasauga:

- Avoiding fragmenting suitable habitat
- Avoiding impact to wetlands
- Avoiding draining or reducing groundwater levels, particularly during the winter
- Limiting disturbance, including mowing, disking, or prescribed burning (prairie maintenance), to periods when snakes are less active, preferably before snakes become active in the spring or after activity has ceased in the fall.
- If the Federal candidate species massasauga rattlesnake is encountered, all work/training would cease and the USFWS would be notified immediately, minimizing any adverse impact to this species.

Impact to developed areas, such as gravel parking areas or roads is not anticipated to have any affect on the snake or its potential habitat. The project would have no direct impact on nearby Wetland C18, a potential winter hibernaculum for the eastern massasauga.

Both the Indiana bat and the eastern massasauga rattlesnake return to their hibernacula from late fall to spring. In order to minimize impacts to both species, development activities (clearing, grading, laying of gravel, and utility line installation) will occur during periods when these species are least likely to be present. For example, tree removal would be restricted to 15 September through 15 April when Indiana bats are less likely to use their summer maternity grounds. Further, all training will be restricted to the 20-acre disturbed area of the PBTA. All personnel that use the site will be notified that the eastern massasauga exists on WPAFB, that the snake is a poisonous protected species, and should not be handle, harmed, or killed.

The open field south of the PBTA main training area, located near an existing wastewater line, is considered a potential habitat for the blazing star stemborer. Disturbance in this area will be restricted to installation of the proposed wastewater line along the edge of the existing gravel lane. Temporarily disturbed areas will be restored with grass vegetation cover. Therefore, no impact to this habitat is anticipated from this action.

Any impacts to the Indiana bat, eastern massasauga rattlesnake, or blazing star stemborer are expected to be indirect and insignificant. The BRAC Remote Field Training Site project is not likely to adversely affect any of the potential threatened and endangered species or their habitat.

Thank you for your consideration. Please contact me at (937) 257-5899 or by email at Karen.Beason@wpafb.af.mil if you have any questions.

Sincerely



Karen N. Beason

Natural Resources Program Manager
Environmental Management Division

cc: Serena Selbo/USFWS
cc: Eric Woods/CH2M HILL
cc: Suzette Cortina/CH2M HILL

1. Figure 1 – Location of Proposed Project Area
2. Figure 3 – Project Area Layout
3. Figure 4 – Proposed Layout Plan
4. Indiana Bat Mist Net Bat Survey

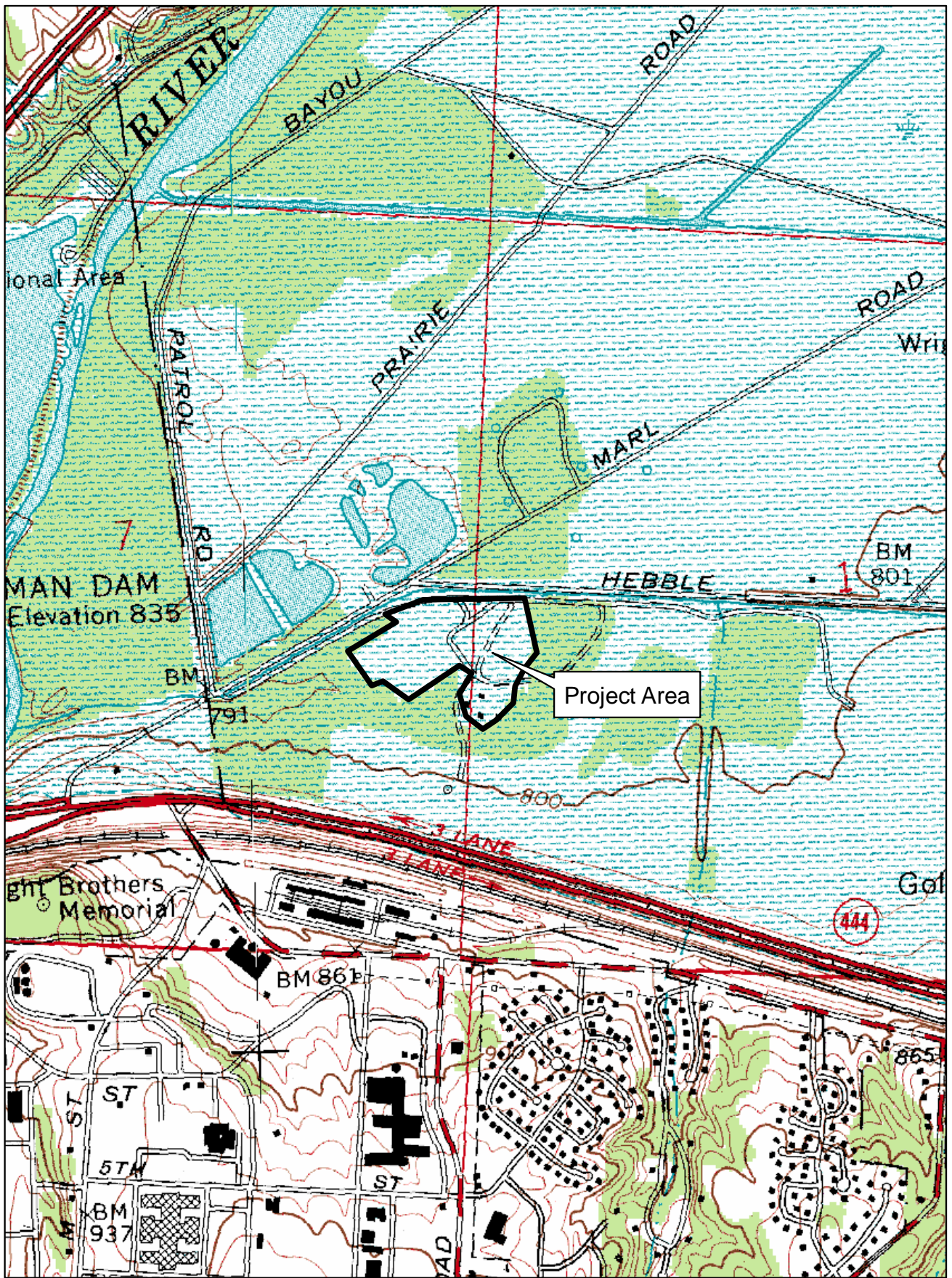


Figure 1
Location of Proposed Project Area
BRAC Environmental Assessment
WPAFB Ohio

Figure 3 is available upon request*, contact:

**Environmental Management Division
88 ABW/CEVO
Cultural Resources Manager
Wright-Patterson AFB
(937) 257-0177**

***following confidentiality requirements under Air Force Instruction 32-7065 (1 Jun 04; Section 4.4)
and pertinent authorities protecting cultural resources.**

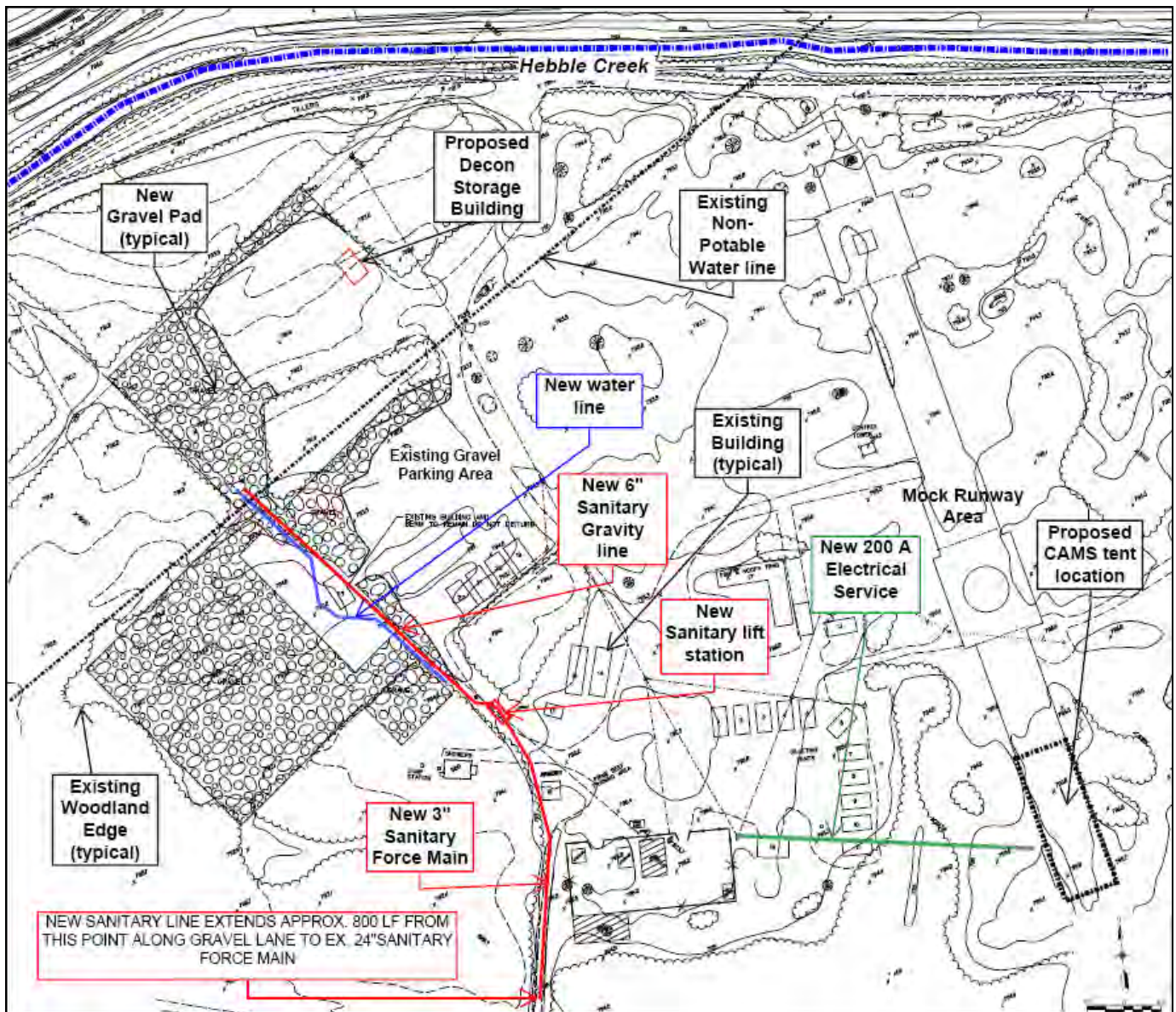
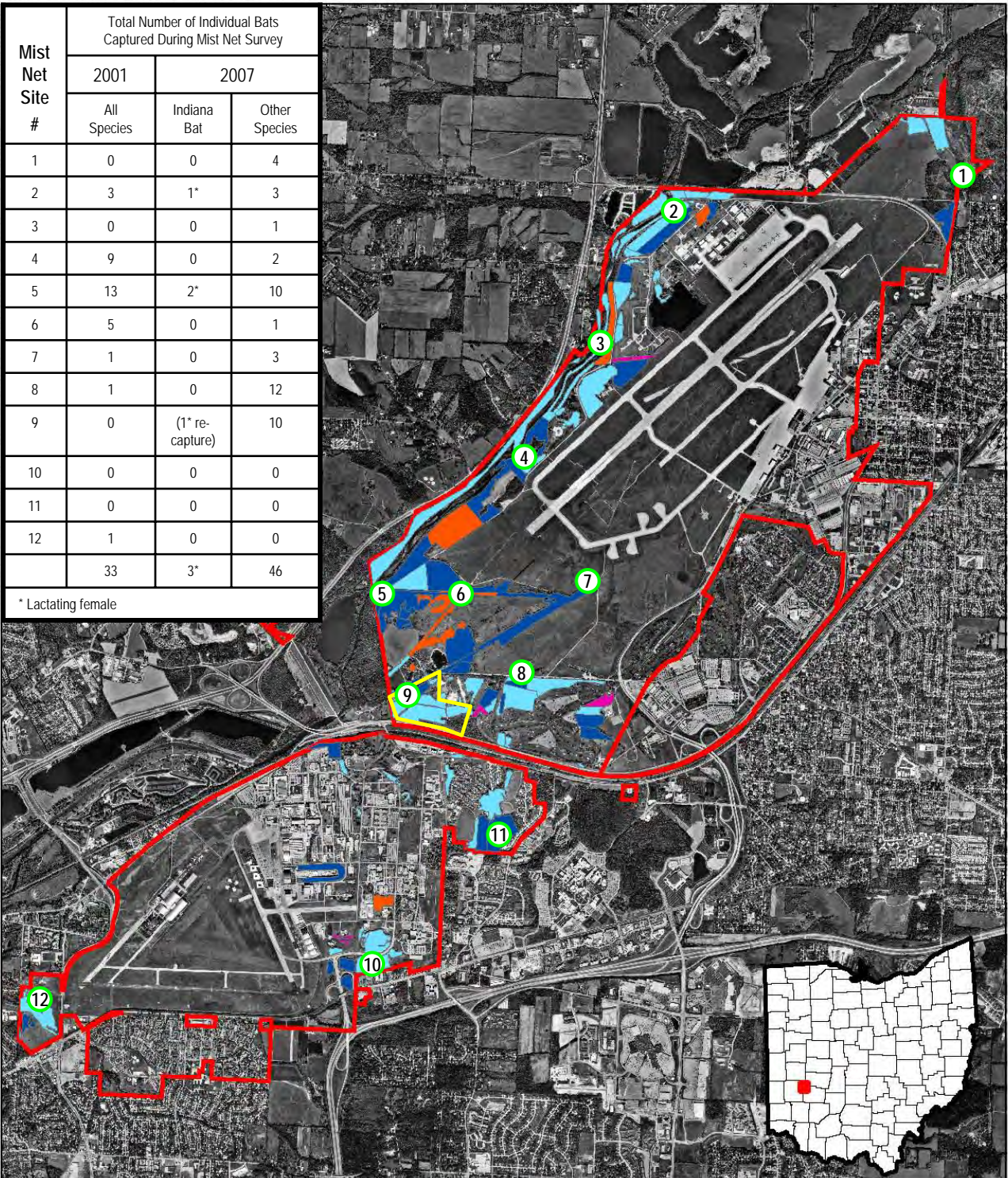


Figure 4

Remote Field Training Site Plan
BRAC Facilities and Remote Field Training Site EA
Wright-Patterson AFB, OH

| Mist Net Site # | Total Number of Individual Bats Captured During Mist Net Survey | | |
|-----------------|-----------------------------------------------------------------|-----------------|---------------|
| | 2001 | 2007 | |
| | All Species | Indiana Bat | Other Species |
| 1 | 0 | 0 | 4 |
| 2 | 3 | 1* | 3 |
| 3 | 0 | 0 | 1 |
| 4 | 9 | 0 | 2 |
| 5 | 13 | 2* | 10 |
| 6 | 5 | 0 | 1 |
| 7 | 1 | 0 | 3 |
| 8 | 1 | 0 | 12 |
| 9 | 0 | (1* re-capture) | 10 |
| 10 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 |
| 12 | 1 | 0 | 0 |
| | 33 | 3* | 46 |

* Lactating female



10 Site #

Installation Boundary

High

Medium

Low

NONE

"PRIME BEEF" AREA

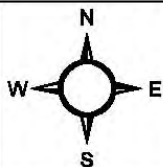


Figure 4. Forest habitat areas ranked by roosting potential on Wright-Patterson Air Force Base.

Project No. 180
October 2006



ENVIRONMENTAL SOLUTIONS
& INNOVATIONS, INC.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
6950 Americana Parkway, Suite H
Reynoldsburg, Ohio 43068-4127
(614) 469-6923/FAX (614) 469-6919

December 27, 2007

Karen Beason
88 ABW/CEVO Bldg 89
5490 Pearson Road
Wight-Patterson AFB, OH 45433

TAILS: 31420-2008-I-0086

Dear Ms. Beason,

The U.S. Fish and Wildlife Service (Service) has reviewed your December 21, 2007 letter regarding Base Realignment and Closure (BRAC) decisions at Wright-Patterson Air Force Base (WPAFB). Your letter provides additional information on impacts to Indiana bat habitat in response to our letter dated January 23, 2007 (TAILS: 31420-2007-I-0089). The WPAFB proposes to make minor improvements to the Prime BEEF (Base Engineer Emergency Force) Training Area. The Prime BEEF Training Area covers 93 acres in Area C of WPAFB, of which approximately 20 acres is previously disturbed.

The project will include placement of gravel or concrete and structures in previously disturbed areas, and clearing of shrubs adjacent to disturbed areas for placement of a sewer line. Training activities include battlefield exercises, medical evacuation activities, use of pyrotechnics and weapon simulators, and heavy equipment training. Training activities may include loud noise during daylight hours. Flood lighting will be placed on site to allow students to traverse the compound at night. All training exercises will occur in previously disturbed areas.

Survey work in 2000 and 2007 detected Indiana bats (*Myotis sodalis*) at WPAFB. In 2007, a lactating female Indiana bat was captured along Hebble Creek in the project area. No potential roost trees occur in the Prime BEEF area and it is assumed that Indiana bats roost elsewhere on WPAFB, but may forage in the project area. No trees are proposed for removal and all shrub removal and ground disturbance associated with the project will occur between September 15 and April 15, when Indiana bats are less likely to be using their summer maternity grounds. Noise and lighting from ongoing training activities is anticipated to be insignificant as it will be minor in scope and occur outside forested areas and known travel corridors. You have determined that the project as proposed is not likely to adversely affect the Indiana bat and eastern massasauga (*Sistrurus catenatus*). Based on the information provided, we concur that the BRAC Prime BEEF project is not likely to adversely affect listed species.

This concludes consultation on this action as required by section 7(a)(2) of the Endangered Species Act. Should, during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the Service should be reinitiated to assess whether the determinations are still valid.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973, as amended, and are consistent with the intent of the National Environmental Policy Act of 1969 and the U. S. Fish and Wildlife Service's Mitigation Policy.

If you have questions, or if we may be of further assistance in this matter, please contact Sarena Selbo at extension 17 in this office.

Sincerely,



for Mary M. Knapp, Ph.D.
Supervisor

cc: ODNR, Div. of Wildlife, SCEA Unit, Columbus, Ohio

Appendix E
Correspondence with the Miami Conservancy District



BOARD OF DIRECTORS
William E. Lukens
Gayle B. Price, Jr.
Thomas B. Rentschler

GENERAL MANAGER
Janet M. Bly

December 5, 2006

Ms. Karen N. Beason
Operations Branch, Environmental Management Division
88 ABW/CEVO Bldg. 89
5490 Pearson Road
Wright Patterson Air Force Base, Ohio 45433-5332

Dear Mr. Beason:

The Miami Conservancy District (MCD) staff has reviewed the proposed locations for multiple supporting mission activities as requested in your November 27, 2006 letter. You are correct that none of the proposed sites are within designated floodplain areas except sites 11 and 12.

Site 11 is within the Huffman Retarding Basin immediately upstream of Huffman Dam and would be subject to periodic flooding as a result of the retarding action of the dam. Site 12 is adjacent to Lilly Creek, a tributary to the Mad River, which experiences occasional high water. MCD has no objection to the proposed surface parking with no fill or structures at either site.

Part of site 10 appears to be within the edge of the Huffman Retarding Basin. Any land upstream of the dam below the spillway elevation of 835 could experience flooding due to backwater from the dam during storage events. Site 10 is likely above the 500-year pool of the dam (elevation 829.0) and would only be flooded during extreme events.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "KAR", written over the word "Sincerely,".

Kurt A. Rinehart
Manager of Engineering and Technical Services

KAR:vlr

cc: Richard Doran

File Reference No. C5-120.0000



DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 88TH AIR BASE WING (AFMC)

WRIGHT-PATTERSON AIR FORCE BASE, OHIO

27 November 2006

88 ABW/CEVO Bldg 89
5490 Pearson Road
Wright-Patterson AFB OH 45433-5332

Kurt Rinehart
Miami Conservancy District
38 E. Monument Avenue
Dayton, OH 45402

Dear Mr. Rinehart

Wright-Patterson Air Force Base (WPAFB) is currently preparing two Environmental Assessments (EAs) to evaluate the environmental impacts of supporting multiple mission activities relocating to WPAFB, OH as part of the Base Realignment and Closure (BRAC) 2005 decisions. The proposed locations for these projects are shown on the enclosed maps. We would like to request your assessment regarding the potential impacts of the projects on floodplains.

The first EA will address upgrading the Area B infrastructure providing adequate site utilities, communications, and roadways that will support multiple mission activities relocating WPAFB (Sites 1, 2, and 3 on attached map). The upgrades would largely occur along existing roadways.

A second EA will address plans to construct new facilities, renovate existing facilities and evaluate locations associated with support functions for the multiple mission activities relocating to WPAFB from other bases around the nation. Site locations 4 through 6, 10 and 13 involve new building construction or additions to existing buildings on primarily open mowed fields/lawns. Sites 7 through 9 are interior renovations of existing structures. Sites 11 and 12 (two alternative sites for one project) involve minor site improvements for mobile medical facility training. Site 11 is an unmowed open field with some perimeter woodland, and site 12 is a mowed field with some woodland.

According to our information, only the mobile medical facility training, Sites 11 and 12, are located in the floodplain. At one or the other of these sites, improvements may include concrete or gravel pads for parking vehicles or equipment, but would include no above-grade fill or structures.

Thank you for your consideration. Please contact me at (937) 257-5899 or by email at karen.beason@wpafb.af.mil if you have any questions.

Sincerely



Karen N. Beason
Operations Branch
Environmental Management Division

cc: Richard Doran/MCD

Suzette Cortina/CH2M HILL

Attachments:

1. USGS Quadrangle Map
2. 2004 Aerial Photo Map
3. General Areas of Proposed Actions and Alternatives



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 88TH AIR BASE WING (AFMC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

20 November 2007

88 ABW/CEVO, Building 89
5490 Pearson Road
Wright-Patterson AFB OH 45433-5332

Kurt Rinehart
Miami Conservancy District
38 E. Monument Avenue
Dayton, OH 45402

Dear Mr. Rinehart

Wright-Patterson Air Force Base (WPAFB) is preparing an Environmental Assessment (EA) for several construction projects in support of missions that are relocating to the WPAFB from other military installations around the nation, as part of the 2005 Base Realignment and Closure (BRAC) recommendations. Previous informal consultation has been provided by the Miami Conservancy District (MCD), reference MCD response letter dated 5 December 2006, regarding minor improvements associated with two proposed locations for the mobile medical field training sites (sites 7 and 10, attachment 1). As part of this process, we would like to request additional consultation regarding the potential impacts on floodplains associated with an additional proposed site.

A third proposed location for the training site (site 9, attachment 1), the Prime BEEF (Base Engineer Emergency Force) Training Area (PBTA), was added to the project after the initial consultation. This request is for additional informal consultation based on the new preferred site. Attachment 2 illustrates the general location of the preferred site, Prime BEEF project area. Attachments 3 and 4 illustrate the layout of the proposed project area, which would include laying of gravel in areas already disturbed for temporary tents and storage. In addition, minor clearing of vegetation (primarily shrubs) may be required immediately adjacent to the disturbed areas for installation of a sewer line.

Other improvements may include concrete or gravel pads for parking vehicles or equipment. The only permanent structure proposed is a non-habitable storage shed (outlined in red on attachments 3 and 4). This 600 square-foot storage shed (see photographs, attachments 5 - 7) would require 650 square feet of gravel area immediately adjacent to the structure used for staging, a water bladder (see attached photograph, attachment 8), and at least 12 storage lockers. Attachment 9 illustrates the alternative site location area within Tillman Pit (site 7, attachment 1), previously addressed as part of the initial consultation, and would include a similar layout and similar components as proposed in the preferred location, the PBTA.

According to our records, the PBTA is located within the Huffman Retarding Basin immediately upstream of Huffman Dam and would be subject to periodic flooding as a result of the retarding action of the dam. The alternate location at Tillman Pit is adjacent to Lilly Creek, a tributary to the Mad River, which experiences occasional high water.

Thank you for your consideration. Please contact me at (937) 257-5899 or by email at Karen.Beason@wpafb.af.mil if you have any questions.

Sincerely

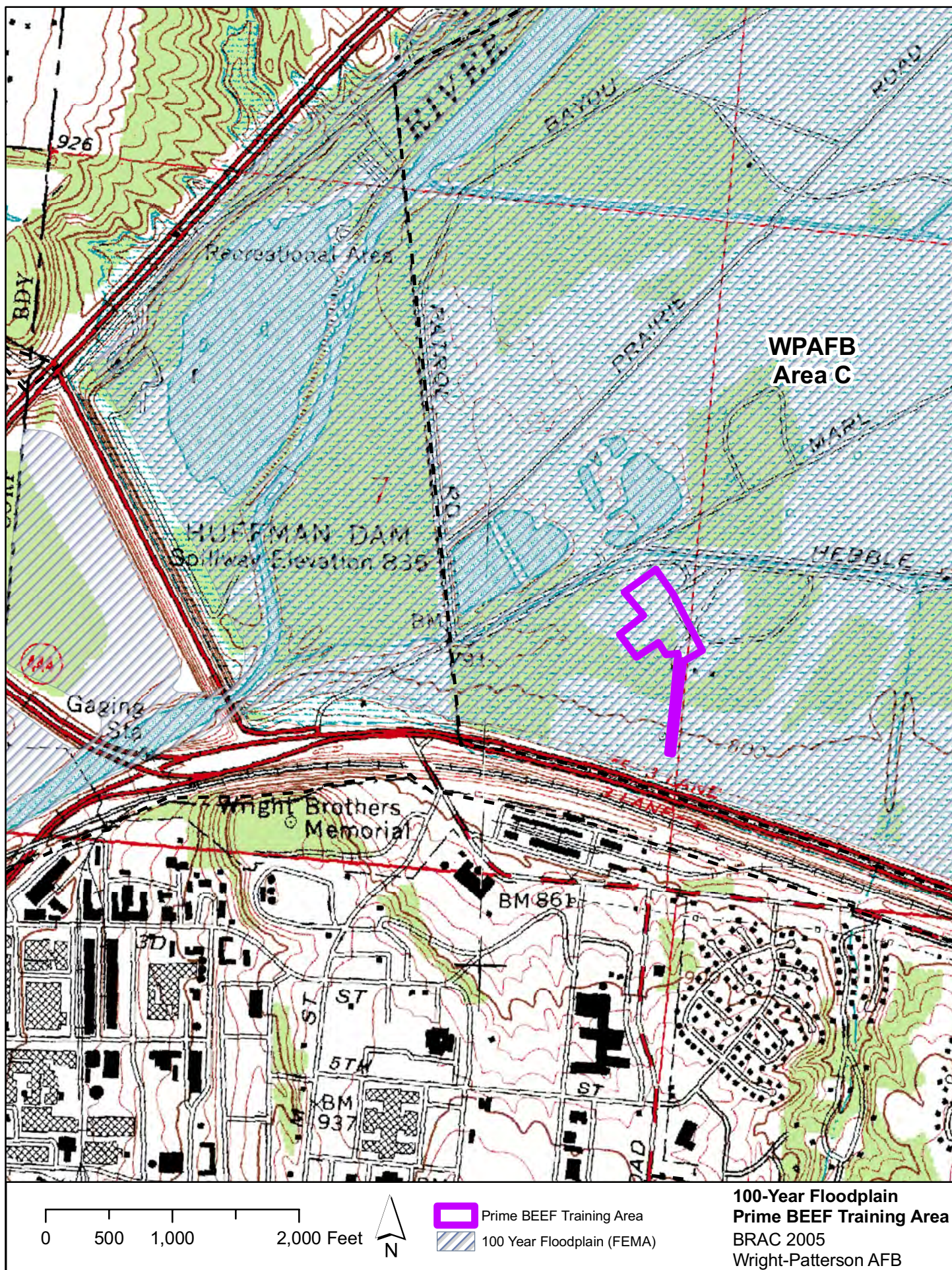


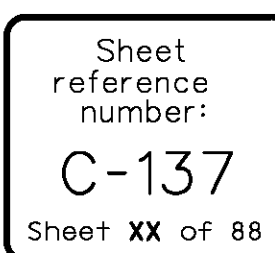
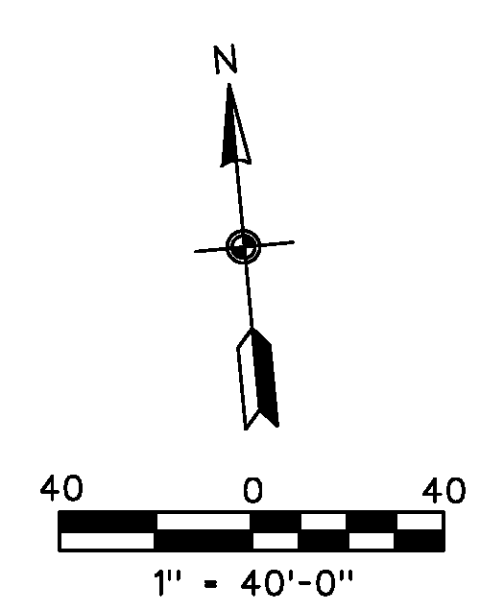
Karen N. Beason
Operations Branch
Environmental Management Division

cc: Eric Woods/CH2M HILL
Suzette Cortina/CH2M HILL

9 Attachments:

1. Proposed BRAC Project Site
2. USGS Quadrangle Map of Prime Beef Area
3. Project Limits/Layout of Prime Beef Area (8½ X 11 scaled plan drawing)
4. Project Limits/Layout of Prime Beef Area (original scaled plan drawing)
5. Photograph of Storage Shed Front View
6. Photograph of Storage Shed Corner View
7. Photograph of Storage Shed Interior
8. Photograph of Storage Shed Water Bladder
9. USGS Quadrangle Map of Tillman Pit







MIAMI
CONSERVANCY
DISTRICT

BOARD OF DIRECTORS

William E. Lukens
Gayle B. Price, Jr.
Thomas B. Rentschler

GENERAL MANAGER

Janet M. Bly

November 27, 2007

Ms. Karen N. Beason
Operations Branch
Environmental Management Division
88 ABW/CEVO, Building 89
5490 Pearson Road
Wright-Patterson Air Force Base, Ohio 45433-5332

Dear Ms. Beason:

The Miami Conservancy District (MCD) staff has reviewed the proposed location of the Prime BEEF Training Area, site 9 on the attachments provided in your letter of November 20, 2007. As you noted, this site is located within the Huffman Retarding Basin just upstream of Huffman Dam.

The provided site plan shows the natural ground elevations are generally above 792 at the proposed Training Area. The enclosed summary of storage events at Huffman Dam indicates that the peak pool elevation has reached elevation 792 at least 48 times since 1922, including five times since January 2004 and twice in 2007. Storage events typically last only a couple of days.

The majority of storage events at Huffman Dam have occurred in the winter months between January and March, but storage events can and have occurred in every month of the year.

MCD has no high water information for Hebble Creek, the un-gaged tributary to the Mad River near the proposed Training Site.

The proposed clearing of brush and installation of gravel pads would not affect MCD operations or the storage capacity of the retarding basin. MCD does not object to the proposed 600 square foot storage building, but no hazardous materials or equipment that is susceptible to flood damage should be stored within the structure.

Please contact me if you have additional questions.

Sincerely,

Kurt A. Rinehart
Chief Engineer

KAR:vlt

Enclosures

File Reference: Property—Huffman Retarding Basin

THE MIAMI CONSERVANCY DISTRICT

HUFFMAN RETARDING BASIN OPERATION

1922 - 2007

(rank on water surface elevation)

| No. | Date (Spillway Pool) | Maximum | Storage | Percent | Pool | Maximum |
|-----|-------------------------|----------------------|----------------------|----------------------------|--------------------------|----------------------------|
| | | Elevation (835.0) | Ac. Ft. (167,000) | Storage Used (100.0) | Area Acres (9,180) | Outflow CFS (35,000) |
| 1 | January 22, 1959 | 809.0 | 25,000 | 15.0 | 2,750 | 21,200 |
| 2 | February 26, 1929 | 805.2 | 14,100 | 8.5 | 2,010 | 18,400 |
| 3 | March 5, 1963 | 804.1 | 12,500 | 7.5 | 1,700 | 18,500 |
| 4 | January 21, 1937 | 801.0 | 7,800 | 4.7 | 1,260 | 15,400 |
| 5 | January 27, 1952 | 800.8 | 7,550 | 4.5 | 1,225 | 13,300 |
| 6 | January 15, 1937 | 799.8 | 6,600 | 3.9 | 1,060 | 0 |
| 7 | February 14, 1948 | 799.3 | 6,100 | 3.7 | 1,000 | 13,300 |
| 8 | March 29, 1924 | 798.0 | 4,800 | 2.9 | 840 | 12,500 |
| 9 | March 10, 1964 | 797.7 | 4,500 | 2.7 | 850 | 12,800 |
| 10 | February 11, 1959 | 797.2 | 4,200 | 2.5 | 760 | 11,600 |
| 11 | June 3, 1947 | 797.0 | 4,050 | 2.4 | 740 | 12,000 |
| 12 | June 9, 1924 | 796.8 | 3,900 | 2.3 | 720 | 0 |
| 13 | May 14, 1933 | 796.7 | 3,800 | 2.3 | 700 | 12,500 |
| 14 | March 7, 1945 | 796.5 | 3,650 | 2.2 | 680 | 11,400 |
| 15 | June 14, 1958 | 796.5 | 3,650 | 2.2 | 680 | 10,700 |
| 16 | January 6, 2005 | 796.2 | 3,450 | 2.1 | 660 | 11,600 |
| 17 | March 20, 1943 | 796.1 | 3,300 | 2.0 | 650 | 11,200 |
| 18 | February 24, 1975 | 796.0 | 3,100 | 2.0 | 630 | 11,400 |
| 19 | April 5, 1957 | 795.7 | 3,000 | 1.8 | 620 | 10,400 |
| 20 | January 5, 2004 | 795.6 | 2,950 | 1.8 | 600 | 11,000 |
| 21 | December 31, 1990 | 795.3 | 2,800 | 1.7 | 590 | 10,400 |
| 22 | January 12, 2005 | 795.0 | 2,600 | 1.6 | 570 | 10,500 |
| 24 | April 15, 1922 | 794.7 | 2,500 | 1.5 | 550 | 0 |
| 23 | February 1, 1982 | 794.7 | 2,500 | 1.5 | 550 | 10,200 |
| 25 | December 31, 1932 | 794.5 | 2,350 | 1.4 | 530 | 0 |
| 26 | February 22, 1951 | 794.5 | 2,350 | 1.4 | 530 | 9,680 |
| 27 | January 6, 1949 | 794.4 | 2,310 | 1.3 | 520 | 9,440 |
| 28 | December 4, 1950 | 794.4 | 2,310 | 1.3 | 520 | 9,680 |
| 29 | June 29, 1980 | 794.1 | 2,200 | 1.3 | 520 | 9,640 |
| 31 | January 20, 1927 | 793.9 | 2,100 | 1.2 | 490 | 9,880 |
| 30 | June 6, 1981 | 793.9 | 2,100 | 1.2 | 490 | 9,470 |
| 33 | January 17, 1950 | 793.8 | 2,060 | 1.2 | 480 | 9,200 |
| 32 | April 30, 1996 | 793.8 | 2,060 | 1.2 | 480 | 9,400 |
| 34 | April 3, 1970 | 793.6 | 1,950 | 1.2 | 460 | 9,170 |
| 35 | March 3, 2007 | 793.3 | 1,850 | 1.1 | 450 | 8,990 |
| 36 | March 21, 1927 | 793.2 | 1,800 | 1.1 | 440 | 0 |
| 37 | March 24, 2007 | 792.9 | 1,650 | 0.9 | 420 | 8,640 |
| 38 | January 19, 1929 | 792.9 | 1,650 | 0.9 | 420 | 0 |
| 39 | February 15, 1950 | 792.8 | 1,630 | 0.9 | 415 | 8,290 |
| 40 | May 12, 1996 | 792.8 | 1,630 | 0.9 | 415 | 8,600 |
| 41 | June 11, 1958 | 792.7 | 1,600 | 0.9 | 410 | 8,320 |
| 42 | May 28, 1968 | 792.7 | 1,600 | 0.9 | 410 | 8,800 |
| 43 | May 8, 1998 | 792.6 | 1,575 | 0.9 | 405 | 8,300 |
| 44 | January 10, 1930 | 792.5 | 1,550 | 0.9 | 400 | 10,600 |
| 45 | April 8, 2000 | 792.4 | 1,500 | 0.8 | 390 | 8,200 |
| 46 | March 19, 1933 | 792.1 | 1,400 | 0.8 | 370 | 0 |

| | | | | | | | |
|-----|--------------------|-------|------|-------|-----|-----|-------|
| 47 | January 7, 1950 | 792.1 | 15.1 | 1,400 | 0.8 | 370 | 7,640 |
| 48 | May 27, 1989 | 792.0 | 15.0 | 1,385 | 0.8 | 370 | 0 |
| 49 | January 11, 1950 | 791.9 | 14.9 | 1,370 | 0.8 | 365 | 7,430 |
| 50 | May 15, 1929 | 791.8 | 14.8 | 1,350 | 0.8 | 360 | 0 |
| 51 | June 3, 1980 | 791.8 | 14.8 | 1,350 | 0.8 | 360 | 7,700 |
| 52 | February 24, 1979 | 791.7 | 14.7 | 1,200 | 0.7 | 350 | 0 |
| 53 | September 15, 1979 | 791.7 | 14.7 | 1,200 | 0.7 | 350 | 7,620 |
| 54 | July 13, 1990 | 791.7 | 14.7 | 1,200 | 0.7 | 350 | 0 |
| 55 | April 7, 1938 | 791.6 | 14.6 | 1,100 | 0.7 | 340 | 7,500 |
| 56 | April 12, 1944 | 791.6 | 14.6 | 1,100 | 0.7 | 340 | 7,620 |
| 57 | January 16, 2007 | 791.6 | 14.6 | 1,100 | 0.7 | 340 | 7,450 |
| 58 | February 16, 1949 | 791.5 | 14.5 | 1,100 | 0.7 | 340 | 6,820 |
| 59 | January 4, 1951 | 791.5 | 14.5 | 1,100 | 0.7 | 340 | 6,820 |
| 60 | June 2, 1997 | 791.5 | 14.5 | 1,100 | 0.7 | 340 | 7,500 |
| 61 | June 26, 1971 | 791.4 | 14.4 | 1,100 | 0.7 | 330 | 7,430 |
| 62 | July 4, 1975 | 791.3 | 14.3 | 1,075 | 0.7 | 320 | 7,400 |
| 63 | January 28, 1994 | 791.3 | 14.3 | 1,075 | 0.7 | 0 | 0 |
| 64 | February 27, 1962 | 791.2 | 14.2 | 1,050 | 0.6 | 315 | 7,140 |
| 65 | December 18, 2001 | 791.2 | 14.2 | 1,050 | 0.6 | 315 | 7,150 |
| 66 | January 4, 2005 | 791.1 | 14.1 | 1,030 | 0.6 | 310 | 7,110 |
| 67 | May 24, 1968 | 791.1 | 14.1 | 1,030 | 0.6 | 310 | 7,400 |
| 68 | April 22, 1964 | 791.0 | 14.0 | 1,020 | 0.6 | 300 | 7,380 |
| 69 | December 19, 1990 | 791.0 | 14.0 | 1,020 | 0.6 | 300 | 0 |
| 70 | May 9, 1996 | 791.0 | 14.0 | 1,020 | 0.6 | 300 | 7,400 |
| 71 | January 18, 1932 | 790.8 | 13.8 | 1,000 | 0.6 | 290 | 8,560 |
| 72 | April 15, 1939 | 790.7 | 13.7 | 950 | 0.5 | 280 | 6,620 |
| 73 | January 19, 1996 | 790.6 | 13.6 | 940 | 0.5 | 275 | 7,000 |
| 74 | April 25, 1937 | 790.4 | 13.4 | 900 | 0.5 | 270 | 0 |
| 75 | January 28, 1949 | 790.4 | 13.4 | 900 | 0.5 | 270 | 6,430 |
| 76 | February 13, 1951 | 790.4 | 13.4 | 900 | 0.5 | 270 | 6,430 |
| 77 | August 10, 1969 | 790.4 | 13.4 | 900 | 0.5 | 270 | 6,680 |
| 78 | March 15, 2007 | 790.4 | 13.4 | 900 | 0.5 | 270 | 6,600 |
| 79 | October 5, 1986 | 790.3 | 13.3 | 850 | 0.5 | 265 | 5,750 |
| 80 | January 25, 1929 | 790.2 | 13.2 | 850 | 0.5 | 260 | 0 |
| 81 | March 12, 1952 | 790.2 | 13.2 | 850 | 0.5 | 260 | 6,240 |
| 82 | April 26, 1961 | 790.2 | 13.2 | 850 | 0.5 | 260 | 6,980 |
| 83 | January 30, 1969 | 790.2 | 13.2 | 850 | 0.5 | 260 | 6,530 |
| 84 | February 17, 1982 | 790.2 | 13.2 | 850 | 0.5 | 260 | 0 |
| 85 | November 17, 1955 | 790.1 | 13.1 | 840 | 0.5 | 260 | 6,430 |
| 86 | March 21, 1945 | 790.0 | 13.0 | 830 | 0.5 | 260 | 6,070 |
| 87 | March 24, 1948 | 790.0 | 13.0 | 830 | 0.5 | 260 | 6,050 |
| 88 | April 14, 1948 | 790.0 | 13.0 | 830 | 0.5 | 260 | 6,050 |
| 89 | April 5, 1950 | 790.0 | 13.0 | 830 | 0.5 | 260 | 6,050 |
| 90 | March 15, 1978 | 790.0 | 13.0 | 830 | 0.5 | 260 | 6,260 |
| 91 | March 13, 1986 | 790.0 | 13.0 | 830 | 0.5 | 260 | 6,340 |
| 92 | February 16, 1990 | 790.0 | 13.0 | 830 | 0.5 | 260 | 0 |
| 93 | December 1, 1927 | 789.9 | 12.9 | 800 | 0.4 | 240 | 0 |
| 94 | April 14, 1979 | 789.9 | 12.9 | 800 | 0.4 | 240 | 0 |
| 95 | February 27, 1936 | 789.8 | 12.8 | 800 | 0.4 | 240 | 6,570 |
| 96 | April 21, 1940 | 789.8 | 12.8 | 800 | 0.4 | 240 | 5,590 |
| 97 | January 25, 1950 | 789.8 | 12.8 | 800 | 0.4 | 240 | 5,870 |
| 98 | April 25, 1970 | 789.8 | 12.8 | 800 | 0.4 | 240 | 6,260 |
| 99 | June 14, 1981 | 789.7 | 12.7 | 680 | 0.4 | 240 | 0 |
| 100 | January 15, 1951 | 789.6 | 12.6 | 660 | 0.4 | 240 | 5,690 |
| 101 | March 23, 1952 | 789.6 | 12.6 | 660 | 0.4 | 240 | 5,690 |

| | | | | | | | |
|-----|-------------------|-------|------|-----|-----|-----|-------|
| 102 | September 2, 2003 | 789.6 | 12.6 | 660 | 0.4 | 240 | 5,700 |
| 103 | February 23, 1971 | 789.5 | 12.5 | 640 | 0.3 | 230 | 6,040 |
| 104 | March 13, 2006 | 789.4 | 12.4 | 620 | 0.3 | 225 | 5,930 |
| 105 | January 31, 1947 | 789.4 | 12.4 | 620 | 0.3 | 225 | 5,510 |
| 106 | May 5, 1958 | 789.4 | 12.4 | 620 | 0.3 | 225 | 6,000 |
| 107 | June 20, 1973 | 789.4 | 12.4 | 620 | 0.3 | 225 | 5,840 |
| 108 | July 2, 1993 | 789.4 | 12.4 | 620 | 0.3 | 0 | 0 |
| 109 | April 15, 2002 | 789.4 | 12.4 | 620 | 0.3 | 225 | 5,900 |
| 110 | May 13, 2002 | 789.4 | 12.4 | 620 | 0.3 | 225 | 5,900 |
| 111 | February 27, 1930 | 789.3 | 12.3 | 600 | 0.3 | 220 | 0 |
| 112 | March 16, 1938 | 789.3 | 12.3 | 600 | 0.3 | 220 | 0 |
| 113 | January 30, 1970 | 789.3 | 12.3 | 600 | 0.3 | 220 | 5,920 |
| 114 | March 4, 1979 | 789.3 | 12.3 | 600 | 0.3 | 220 | 0 |
| 115 | August 9, 1995 | 789.3 | 12.3 | 600 | 0.3 | 220 | 6,000 |
| 116 | April 24, 1996 | 789.3 | 12.3 | 600 | 0.3 | 220 | 5,900 |
| 117 | December 1, 2006 | 789.2 | 12.2 | 590 | 0.3 | 215 | 5,810 |
| 118 | December 15, 1977 | 789.2 | 12.2 | 580 | 0.3 | 215 | 5,660 |
| 119 | February 24, 1985 | 789.2 | 12.2 | 580 | 0.3 | 215 | 5,750 |
| 120 | July 18, 1992 | 789.1 | 12.1 | 560 | 0.3 | 205 | 0 |
| 121 | April 19, 1933 | 789.0 | 12.0 | 550 | 0.3 | 200 | 0 |
| 122 | April 4, 1989 | 789.0 | 12.0 | 550 | 0.3 | 200 | 0 |
| 123 | January 24, 1996 | 789.0 | 12.0 | 550 | 0.3 | 200 | 5,900 |
| 124 | November 26, 1986 | 788.8 | 11.8 | 520 | 0.3 | 190 | 0 |
| 125 | May 17, 1990 | 788.8 | 11.8 | 520 | 0.3 | 190 | 0 |
| 126 | July 10, 2003 | 788.8 | 11.8 | 520 | 0.3 | 190 | 5,200 |
| 127 | January 18, 1969 | 788.6 | 11.6 | 500 | 0.3 | 185 | 5,460 |
| 128 | April 3, 1977 | 788.6 | 11.6 | 500 | 0.3 | 185 | 5,420 |
| 129 | May 2, 1983 | 788.6 | 11.6 | 500 | 0.3 | 185 | 5,350 |
| 130 | January 23, 1982 | 788.5 | 11.5 | 480 | 0.2 | 180 | 0 |
| 131 | December 23, 1990 | 788.5 | 11.5 | 480 | 0.2 | 180 | 0 |
| 132 | April 16, 1998 | 788.5 | 11.5 | 480 | 0.2 | 180 | 5,300 |
| 133 | May 22, 1957 | 788.4 | 11.4 | 470 | 0.2 | 175 | 5,340 |
| 134 | January 22, 1999 | 788.4 | 11.4 | 470 | 0.2 | 175 | 5,300 |
| 135 | March 17, 1943 | 788.3 | 11.3 | 470 | 0.2 | 175 | 5,340 |
| 136 | May 18, 1995 | 788.3 | 11.3 | 470 | 0.2 | 175 | 5,250 |
| 137 | January 8, 1998 | 788.3 | 11.3 | 470 | 0.2 | 175 | 5,200 |
| 138 | June 15, 1998 | 788.3 | 11.3 | 470 | 0.2 | 175 | 5,200 |
| 139 | July 29, 2001 | 788.3 | 11.3 | 470 | 0.2 | 175 | 5,200 |
| 140 | April 26, 1965 | 788.2 | 11.2 | 450 | 0.2 | 170 | 5,160 |
| 141 | June 25, 1969 | 788.2 | 11.2 | 450 | 0.2 | 170 | 5,130 |
| 142 | November 14, 1972 | 788.2 | 11.2 | 450 | 0.2 | 170 | 5,150 |
| 143 | March 16, 1982 | 788.2 | 11.2 | 450 | 0.2 | 170 | 0 |
| 144 | March 5, 1993 | 788.2 | 11.2 | 450 | 0.2 | 0 | 0 |
| 145 | March 5, 1964 | 788.1 | 11.1 | 400 | 0.2 | 165 | 5,270 |
| 146 | February 5, 1971 | 788.1 | 11.1 | 400 | 0.2 | 165 | 5,140 |
| 147 | April 2, 1974 | 788.1 | 11.1 | 400 | 0.2 | 165 | 5,080 |
| 148 | December 17, 1996 | 788.1 | 11.1 | 400 | 0.2 | 165 | 5,200 |
| 149 | January 31, 1939 | 788.0 | 11.0 | 400 | 0.2 | 160 | 0 |
| 150 | June 6, 2002 | 788.0 | 11.0 | 400 | 0.2 | 160 | 4,950 |
| 151 | February 6, 2004 | 788.0 | 11.0 | 400 | 0.2 | 160 | 4,990 |

Appendix F
State Historic Preservation Office
Coordination Letters

APPENDIX F
Index of Correspondence

| To | From | Date | Appendix F Page Number |
|---------------------------------------------------|---------------------------------------------------------------------|------------------|---------------------------|
| Mark Epstein Ohio Historic Preservation Office | Raymond Baker 88 ABW/CEVO WPAFB | 13 April 2007 | 1 |
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| Mark Epstein Ohio Historic Preservation Office | Raymond Baker 88 ABW/CEVO WPAFB | 17 August 2007 | 6 |
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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 88TH AIR BASE WING (AFMC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

13 April 2007

88 ABW/CEVO, Bldg 89
5490 Pearson Road
Wright-Patterson AFB OH 45433-5332

Mr. Mark Epstein
Department Head, Resource Protection & Review
Ohio Historic Preservation Office
567 East Hudson Street
Columbus OH 43211-1030

Dear Mr. Epstein

This letter serves as advance notification of Base Realignment and Closure (BRAC) activities at Wright-Patterson Air Force Base (WPAFB) that will trigger Section 106 of the National Historic Preservation Act. We are currently preparing two Environmental Assessments (EA) to evaluate the environmental and cultural impacts of supporting multiple mission activities relocating to WPAFB as part of the BRAC 2005 decisions. The proposed locations for these projects are shown on the enclosed draft map (Attachment 1).

The first EA will address upgrading the Area B infrastructure providing adequate site utilities, communications, and roadways that will support multiple mission activities relocating to WPAFB (Site 1 on the attached map). The upgrades will largely occur along existing roadways and the only potential impact to historic resources is to the WPAFB Mound, Site #33 GR 31, which is currently listed on the NRHP. Measures will be taken to ensure the mound is not impacted by the infrastructure construction.

The second EA will address plans to construct approximately 700,000 square feet of new facilities, renovate approximately 300,000 square feet of existing facilities, and evaluate locations associated with support functions for the multiple mission activities relocating to WPAFB from other bases around the nation. Site locations 2, 3, 5, 6, 8, and 11 involve new building construction or additions to existing buildings on primarily open mowed fields/lawns. Site 4 is interior renovation of existing structures. Sites 7, 9, and 10 (three alternative sites for one project) involve minor site improvements for mobile medical field training.

Buildings 20012, 20017, and 20620 have been selected to fill some of the administrative and laboratory space needs of the inbound missions. It has been proposed that Buildings 20012 and 20017 be completely renovated including exteriors, interiors, building systems, and moderate demolition work. An addition to Building 20620 has been proposed. Facilities 20012 and 20017 are contributing buildings to the Wright Field Historic District. Additionally, Facilities 20012 and 20620 are individually eligible for the NRHP. The Ohio Historic Inventory Forms for these buildings are included in Attachment 2.

It is our intent that the design for the renovations/additions for Facilities 20012, 20017, and 20620 will be in keeping with the Secretary of the Interior's Standards and Guidelines for Historic Facilities. As

the EA's are completed and design documents drafted, these will be forwarded to your office for review and concurrence.

Should you have any comments or questions, I can be reached at (937) 257-0177, or via email at raymond.baker@wpafb.af.mil.

Sincerely

A handwritten signature in black ink, reading "Raymond F. Baker". The signature is fluid and cursive, with the first name "Raymond" and last name "Baker" clearly legible.

RAYMOND F. BAKER
Cultural Resources Program Manager
Operations Branch
Environmental Management Division

Attachments:

1. Draft BRAC Overview Map
2. Ohio Historic Inventory Forms for Buildings 20012, 20017, and 20620



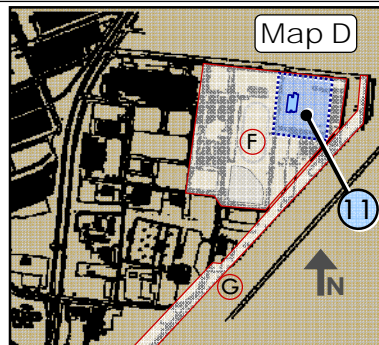
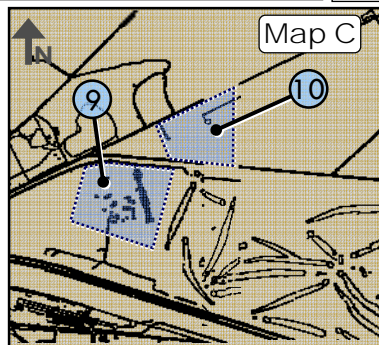
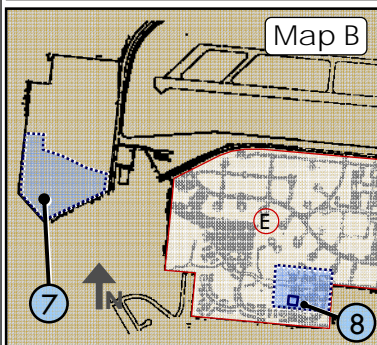
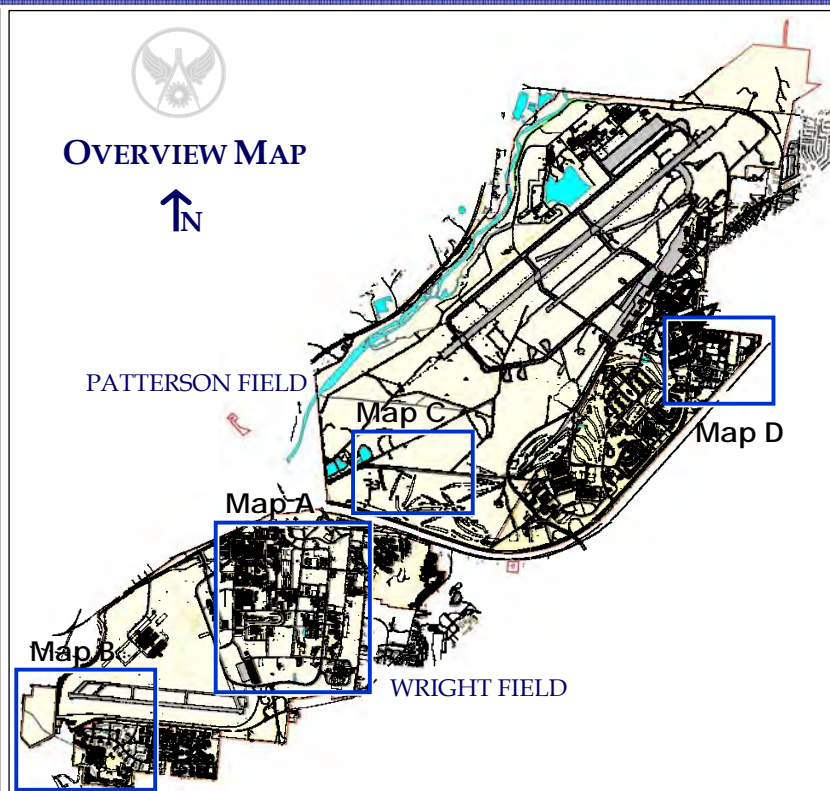
BRAC MILCON

Proposed BRAC Project Sites:

1. Construct Transportation, Utilities, Storm Water Control, and Communications Infrastructure Upgrades
2. Construct Human Performance Wing (HPW) Campus Facilities for USAFSAM, AFIOH, NAMRL and AFRL
3. Construct Bldg 20838 Vivarium Addition
4. Renovate Bldgs 20012 & 20017 for HSG/YA and Fixed-Wing Development & Acquisition
5. Construct Bldg 20620 Addition/Alteration for AFRL/SN
6. Expand Hazardous Waste Storage Facility Bldg 20479 to Support HPW Operations
7. Establish USAFSAM Field Training Site - Alt 1 / Tillman Pit (Area B)
8. Construct Addition to Chapel Lane Religious Education Center, Bldg 20229
9. Establish USAFSAM Field Training Site - Alt 2 / 445AW Prime BEEF Complex (Area C)
10. Establish USAFSAM Field Training Site - Alt 3 / Near Huffman Prairie (Area C)
11. Construct USAFSAM Pipeline Student Dorm – Kittyhawk Community Center

Current Planning Initiatives:

- A. ASC Information Technology Center (ITC)
- B. AAFES Commercial Dual-Food Facility
- C. AFRL Materials Lab Campus
- D. AFIT Campus
- E. Privatized Family Housing
- F. Dorm Master Plan Area
- G. New SR 444 Corridor

**LEGEND**

- EXISTING
- BRAC GENERAL DEVELOPMENT AREA
- BRAC FACILITIES AREA
- BRAC PARKING AREA
- CURRENT PLANNING INITIATIVES

DRAFT

Date

88th Civil Engineer Director

DRAFT

Date

88th Air Base Wing Commander



June 14, 2007

Raymond F. Baker
Cultural Resources Manager
Operations Branch
Environmental Management Division
88 ABW/CEVA, Bldg 89
5490 Pearson Road
Wright-Patterson Air Force Base, Ohio 45433-5332

Dear Mr. Baker:

Re: Base Realignment and Closure activities at Wright-Patterson Air Force Base

This is in response to correspondence received on April 16, 2007. My comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and the associated regulations at 36 CFR Part 800.

Base Realignment and Closure (BRAC) activities throughout the Department of Defense will result in multiple mission activities relocating to Wright-Patterson Air Force Base (WPAFB). These activities will include (1) upgrading the Area B infrastructure to provide adequate site utilities, communications, and roadways and (2) the construction of approximately 700,000 square feet of new facilities, rehabilitation of approximately 300,000 square feet of existing facilities, and the evaluation of locations associated with support functions for the mission activities that will be relocating to the base.

WPAFB is in the process of preparing Environmental Assessments for each project. Early indications are that the proposed upgrade to Area B infrastructure will be largely limited to work along existing roadways. WPAFB is aware of the project's potential to affect WPAFB Mound (33GR31), which is listed in the National Register of Historic Places, and will take precautionary measures to ensure that the mound is not impacted by the infrastructure construction. Buildings 20012, 20017, and 20620 have been selected to house administrative and laboratory space associated with the incoming missions. WPAFB is aware that these three buildings have been determined to be eligible for listing in the National Register of Historic Places and intends to design the proposed work at the facilities to conform to the Secretary of the Interiors Standards for the Treatment of Historic Properties.

It is our understanding that WPAFB will provide copies of the completed Environmental Assessments and design documents to OHPO as they become available to facilitate Section 106 review. We will look forward to working with you throughout the consultation process established in 36 CFR Part 800.

OHIO HISTORICAL SOCIETY

Ohio Historic Preservation Office

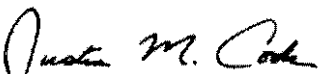
567 East Hudson Street, Columbus, Ohio 43211-1030 ph: 614.298.2000 fx: 614.298.2037
www.ohiohistory.org

Raymond F. Baker
June 14, 2007

Page Two

If you have any questions, please contact me by phone at (614) 298-2000 or by e-mail at jcook@ohiohistory.org. Thank you for your cooperation.

Sincerely,

A handwritten signature in cursive script that reads "Justin M. Cook".A large, stylized handwritten flourish or loop that starts from the bottom left and curves upwards and to the right, ending near the signature.

Justin M. Cook, History Reviews Manager
Resource Protection and Review

1012215



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 88TH AIR BASE WING (AFMC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

17 August 2007

88 ABW/CEVO, Bldg 89
5490 Pearson Road
Wright-Patterson AFB OH 45433-5332

Mr. Mark Epstein
Department Head, Resource Protection & Review
Ohio Historic Preservation Office
567 East Hudson Street
Columbus OH 43211-1030

Dear Mr. Epstein

This letter is a follow-up to our letter dated 13 Apr 07. Wright-Patterson Air Force Base (WPAFB) is currently preparing two Environmental Assessments (EA) to evaluate the environmental and cultural impacts of supporting multiple mission activities relocating to WPAFB as part of the Base Realignment and Closure (BRAC) 2005 decisions. We have decided to evaluate the impacts by assessing the infrastructure systems upgrades in one EA (titled Infrastructure EA), followed by assessing the impacts from the facility construction/renovation projects in the second EA (titled Facilities EA). The entire BRAC project includes eleven proposed project site locations as shown on the enclosed draft maps (Attachment 1).

The first EA which assesses the infrastructure upgrades in the Area B Hilltop area is in draft final form and is currently undergoing a 30 day public review period (8 Aug – 7 Sep 07). This EA evaluates a proposed action (Alternative 1) and two alternatives.

The second EA will evaluate plans to construct approximately 700,000 square feet of new facilities, renovate approximately 300,000 square feet of existing facilities, and evaluate locations associated with support functions for the multiple mission activities relocating to WPAFB from other bases around the nation. In Attachment 1, Map 1, site locations 2, 3, 5, 8, and 11 involve new building construction or additions to existing buildings on primarily open mowed fields/lawns. Site 4 is interior/exterior renovation of existing structures. Sites 9 and 10 (two alternative sites for one project) involve minor site improvements for mobile medical field training. Since our notification letter to you, project sites 6 and 7 on Map 1 have been removed from the project and projects 1 and 2 on Map 2 of Attachment 1 have been added. We are scheduled to receive the draft Facilities EA in Dec 07.

Our office understands that SHPO considers the entire BRAC effort as one undertaking, even though we have separated our assessment into two EAs. We acknowledge that in order for your office to make a determination of adverse affect or not, you need to consider both infrastructure and facility impacts as one undertaking. Consequently, we have included for your consultation the footprint of the proposed new facilities in the Area B Hilltop area which also are within the area of potential affect evaluated in the Infrastructure EA.

We have determined that no adverse effects to historic properties will occur by this undertaking as evaluated in the Infrastructure EA, in addition to the proposed new facility construction in the Hilltop area. In accordance with 36 CFR 800.11(d), we are submitting the following documentation.

Description of the undertaking assessed by the Infrastructure EA. The Proposed Action is to construct new infrastructure and upgrade and/or replace existing infrastructure systems in the Area B Hilltop District of WPAFB to prepare the area for future facilities associated with inbound BRAC missions. The location of the infrastructure upgrades must be in close proximity to the new facilities that would be constructed. Infrastructure systems to be upgraded include roadways; electrical power; communications; steam and water distribution systems; and sanitary and storm sewers. Activities associated with the infrastructure upgrades would include demolition of Facilities 20430 and 20682, site preparation, road construction, trenching, re-grading, and landscaping. Minimal site preparation activities (for example, clearing and grubbing) are anticipated in portions of the project area which are located primarily in open lawn. Extensive site preparation activities are anticipated in the location of the proposed new entrance/gate. Because the exact location of the facilities associated with the inbound BRAC missions has not been finalized, the portion of the utilities that tie into each building will not be completed until the facilities are under construction. Existing and/or new utilities would be routed out of the way of the new buildings. It is proposed that utilities will be installed below grade approximately 5 to 6 feet.

Under Alternative 2, the No Action Alternative, it is assumed that infrastructure upgrades would not be completed. This alternative serves as a baseline against which the Proposed Action can be compared.

Under Alternative 3, the infrastructure upgrades would be phased to coordinate with the construction of each facility associated with the inbound BRAC missions instead of as a single overall effort. Each component listed under the Proposed Action would be included in this alternative. This alternative could potentially increase the cost and length of time to complete the infrastructure upgrades by segmenting the project.

The area of potential effects (APE) for the Proposed Action and Alternative 3 is identified in Figure 13 (Attachment 2) by two red outlined project areas. The larger project area borders the eastern edge of the Wright Field Historic District (also a historic cultural landscape) and encompasses the WPAFB Mound (33 GR 31) and includes infrastructure system (utility and road) upgrades, site preparation, road construction, closing of Gate 19B, creating a new gate off National Road, and two building demolitions. The smaller project area is located within the Wright Field Historic District and involves two proposed wastewater system upgrades to existing sanitary lines along F and G Streets. Figures 3 and 5 through 10 in Attachment 2 are detailed maps of the proposed individual infrastructure system upgrades. There is no APE for Alternative 2 because no activity would occur under this action.

Description of the new Hilltop Facility Construction undertaking. WPAFB proposes to construct approximately 700,000 square feet of new facilities in the Hilltop area both on the north and south sides of Fifth Street. North and south parking lots will be required for their respective buildings, with the central lot to the east supplying the remaining population a location that can serve both buildings simultaneously. The proposed architecture in the 35% design submittal for the new facilities will be a maximum of three stories with precast brick and glass banding to crisp precast volumes on a base of brick, against the background of a glass circulation spine. It is anticipated that the building foundations for the new facilities in the Hilltop area will range from 8 to 13 feet below grade. Attachment 3 contains

35% design conceptual building layout, elevations and aerial views. The APE for the new Hilltop facilities construction is the same larger project area as identified above for the infrastructure Proposed Action (Attachment 2, Figure 13).

Description of steps taken to identify historic properties. WPAFB has assessed all buildings on the installation that are 50 years old or older, and has assessed buildings for exceptional significance relating to the Cold War. Your office has reviewed the information we have collected, and our two offices have reached a consensus determination of eligibility for listing on the National Register of Historic Places (NRHP) for facilities at WPAFB. We have also undertaken archeological surveys for prehistoric and historic-era archaeological sites, and have provided reports of those surveys to your office for review.

The smaller project area is located within the Wright Field Historic District and involves two proposed wastewater system upgrades to existing sanitary lines along F and G Streets (Attachment 2, Figure 7). Approximately 350 feet and 525 feet of sanitary lines along F and G Streets, respectively, will be removed and upgraded with new lines in the existing locations. Since the new lines will be installed in the existing sanitary trenches there will be no impacts to the surrounding historic buildings nor is it likely that any archaeological resources would be discovered or impacted since it is an existing disturbed area.

The larger project area borders the eastern edge of the Wright Field Historic District and includes the new Hilltop facility construction, infrastructure system (utility and road) upgrades, site preparation, road construction, closing of Gate 19B, creating a new gate off National Road, and demolition of Facilities 20430 and 20682. Buildings 430 and 682 in Area B, have been evaluated and determined ineligible for NRHP listing and are not part of any historic landscape or district. See Attachment 4 for OHI forms.

In 1990, the U.S. Army Construction Engineering Research Laboratory (USACERL) conducted a prehistoric survey covering 400 acres located in the Hilltop area. The following three prehistoric archaeological sites were discovered: 33 GR 796, 33 GR 797, 33 GR 798 (see Attachment 2, Figure 13 for location within the APE). In August 2002 Hardlines Design Company conducted Phase II testing of these three sites and WPAFB concluded, with SHPO concurrence, that the three sites were not eligible for the NRHP. In October-December 2001, Gray & Pape, Inc. conducted Phase I investigations at WPAFB as a part of the base's ongoing Section 110 responsibilities for identifying and protecting historic properties on its land. The project was focused on identifying potential prehistoric resources located in areas previously identified as having a low to moderate probability for containing prehistoric sites. An area between National Road and Q Street was surveyed and Site 33 GR 1171 was discovered, but it lacked research potential because of its light density of cultural remains (see Attachment 2, Figure 13 for location within the APE). WPAFB determined the site to be ineligible for the NRHP and SHPO concurred in a letter dated 5 Apr 02.

The only known NRHP listed archaeological resource located within the APE is the WPAFB Mound, Site 33 GR 31, which is located at the corner of Hobson Way and Seventh Street (see Attachment 2, Figure 13). The only infrastructure upgrade that may have a potential to impact the mound is the installation of a new water line along the west side of Hobson Way (see Attachment 2, Figure 6). The proposed construction will approach no closer than 50 feet from the mound; therefore, no impacts to this resource are expected.

Basis for determining no historic properties adversely affected. The cultural resources assessment in the Infrastructure EA is described in Sections 3.7 and 4.7 of the attached excerpt from the draft EA

(Attachment 5). Should inadvertent discoveries of cultural resources occur during ground-disturbing activities, the work will immediately cease and the base Cultural Resources Manager (CRM) will be notified. The procedures for inadvertent discoveries outlined in Section D.2.4 in our Integrated Cultural Resources Management Plan, May 2006, which include SHPO notification, will be followed. In addition the construction contractor will be made aware of WPAFB procedures prior to the start of any construction activities. The following protective measures will be followed to ensure the WPAFB Mound will not be impacted by construction activities:

1. Prior to the start of any work, the CRM will conduct a site visit at the mound with the construction contractor to identify its location.
2. Prior to the start of any work, the CRM will install stakes and caution tape with a buffer zone of 40 feet around the mound to notify workers not to cross the tape.
3. Once construction work begins, the CRM will conduct weekly inspections at the mound to ensure work does not encroach upon the buffer zone or the mound.

Based upon our past archaeological surveys, historic building evaluations, and protective measures for the WPAFB Mound, we have determined that no historic properties will be adversely impacted within the two project areas. Therefore, this undertaking, which includes both the infrastructure systems upgrades and the new Hilltop facility construction, will not adversely affect historic or cultural resources at WPAFB.

Please review the documentation we have provided and let us know whether you concur with our assessment. Should you have questions, I can be reached at (937) 257-0177, or via email at raymond.baker@wpafb.af.mil.

Sincerely



RAYMOND F. BAKER
Cultural Resources Program Manager
Operations Branch
Environmental Management Division

Attachments

1. BRAC Project Site Maps
2. Figures
3. 35% Design Building Concepts
4. Facility 20430 and 20682 OHI Forms
5. Excerpts from Draft Infrastructure EA



September 5, 2007

Raymond F. Baker
Cultural Resources Program Manager
Operations Branch
Environmental Management Division
88 ABW/CEVO, Building 89
5490 Pearson Road
Wright-Patterson Air Force Base, Ohio 45433-5332

Dear Mr. Baker:

Re: Hilltop Facility construction and proposed wastewater systems upgrades along
F and G Streets, Area B, Wright-Patterson Air Force Base, Ohio

This is in response to correspondence received on August 20, 2007. My comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and the associated regulations at 36 CFR Part 800.

As part of a series of projects related to Base Realignment and Closure (BRAC) activities throughout the Department of Defense, Wright-Patterson Air Force Base (WPAFB) proposes to complete site preparation work in the Hilltop region in Area B of the base to facilitate the construction of approximately 700,000 square feet of new facilities. Work will include utility and road upgrades, road and parking lot construction, the closing of Gate 19B and creation of a new gate off National Road, site grading, and demolition of Facilities 20430 and 20682.

Following the completion of site preparation, several new buildings will be constructed throughout the base. The only construction project for which preliminary design information is currently available is the new Human Performance Wing (HPW) facility in the Hilltop region of Area B. A new building will be constructed on both the north and south sides of Fifth Street between Hobson Way and Q Street to house the HPW. These two buildings will be a maximum of three stories tall, feature steel frame construction with precast brick and glass curtain wall exteriors, and utilize glass circulation spines.

In addition to work to be completed in the Hilltop region, WPAFB proposes to complete upgrades to approximately 350 feet of sanitary sewer lines along F Street and approximately 525 feet of sanitary sewer lines along G Street in Area B of the base. Work will be limited to installing new lines in existing trenches.

Based on available archaeology and history/architecture survey data, information provided in your submission dated August 17, 2007, and observations made during our July 17, 2007 site visit to WPAFB, we concur with your finding that the proposed work will have no adverse effect on historic properties provided that the following conditions are met:

OHIO HISTORICAL SOCIETY

Ohio Historic Preservation Office

567 East Hudson Street, Columbus, Ohio 43211-1030 ph: 614.298.2000 fx: 614.298.2037
www.ohiohistory.org

Page Two

1. Prior to the start of any work, the base Cultural Resources Manager (CRM) will conduct a site visit at WPAFB Mound with the construction contractor to identify its location.
2. Prior to the start of any work, the CRM will install stakes and caution tape with a buffer zone of 40 feet around WPAFB Mound to notify workers not to cross the tape.
3. Once construction work begins, the CRM will conduct weekly inspections at WPAFB Mound to ensure work does not encroach upon the buffer zone or the mound.
4. Following the completion of site preparation work but prior to the start of construction activities, WPAFB will submit site plans and elevation drawings for all new buildings to be constructed as part of the BRAC activities at the base to the Ohio Historic Preservation Office for review and comment. OHPO will provide comments regarding the plans' conformance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* as they apply to new construction adjacent to historic properties. If OHPO feels that a proposed construction activity has the potential to violate relevant Standards, WPAFB will reinstitute Section 106 consultation following the process outlined in 36 CFR Section 800.6.

No additional information regarding the proposed Human Performance Wing facility is needed because sufficient documentation was included in your submission for us to concur with your finding that the construction of this facility will conform to the Standards and have no adverse effect on historic properties.

5. Prior to the commencement of BRAC-related construction activity associated with the rehabilitation of buildings that have been determined to be eligible for listing in the National Register of Historic Places, WPAFB will submit plans, specifications, and photographs of the affected areas of the buildings to OHPO for review and comment. OHPO will provide comments regarding the plans' conformance with the *Secretary of the Interior's Standards for Rehabilitation*. If OHPO feels that a proposed rehabilitation activity has the potential to violate the Standards, WPAFB will reinstitute Section 106 consultation following the process outlined in 36 CFR Section 800.6.

We look forward to working with you as BRAC-related construction projects are developed in more detail. If you have any questions, please contact Justin Cook, History Reviews Manager, by phone at (614) 298-2000 or by email at jcook@ohiohistory.org. Thank you for your cooperation.

Sincerely,



Mark J. Epstein, Department Head
Resource Protection and Review

MJE:jc

1014850



DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 88TH AIR BASE WING (AFMC)

WRIGHT-PATTERSON AIR FORCE BASE, OHIO

30 November 2007

MEMORANDUM FOR MR. MARK EPSTEIN
DEPARTMENT HEAD, RESOURCE PROTECTION & REVIEW
OHIO HISTORIC PRESERVATION OFFICE
567 EAST HUDSON STREET
COLUMBUS OH 43211-1030

FROM: 88 ABW/CEVO
Building 89
5490 Pearson Road, Area C
Wright-Patterson AFB OH 45433-5332

SUBJECT: Base Realignment and Closure Facility Renovation and New Facility Construction

References: (a) 88 ABW/CEVO 13 Apr 07 letter
(b) OHPO 5 Sep 07 letter, #1014850

1. This correspondence is a follow-up to our letter dated 13 Apr 07 and OHPO's letter dated 5 Sep 07, regarding the facility renovation and new facility construction to accommodate incoming Base Realignment and Closure (BRAC) missions at Wright-Patterson Air Force Base (WPAFB). This letter addresses the rest of the proposed facility work to be accomplished as part of the BRAC 2005 decisions affecting WPAFB. The area of potential effects (APE) includes ten proposed project site locations identified on the enclosed draft map by the blue highlighted project areas (Attachment 1). In Attachment 1, Project Site locations 3 through 8 involve new building construction or additions to existing buildings on primarily open mowed fields/lawns. Sites 1 and 2 are interior/exterior renovations of existing facilities. Sites 9 and 10 (two alternative sites for one project) involve site improvements for mobile medical field training. The other two site maps contained in Attachment 1 depict detailed locations of the proposed project sites and identify known historic properties on WPAFB. We have determined that no adverse effects to historic properties will occur by this undertaking. In accordance with 36 CFR 800.11(e), we are submitting the following documentation.
2. Description of undertaking and steps taken to identify historic properties. WPAFB has assessed all buildings on the installation that are 50 years old or older, and has assessed buildings for exceptional significance relating to the Cold War. Your office has reviewed the information we have collected, and our two offices have reached a consensus determination of eligibility for listing on the NRHP for facilities at WPAFB. We have also undertaken archaeological surveys for prehistoric and historic-era archaeological sites, and have provided reports of those surveys to your office for review. Based on previous archaeological surveys and the high level of soil disturbance, the entire installation (100%) is regarded as surveyed. The following APE's are listed below:
 - a. Facility 20012 Interior/Exterior Renovation (Site 1): Facility 20012 was constructed in 1935 as the Technical Data Building and is a contributing element to the Wright Field Historic District located in Area B of WPAFB. The building is also individually eligible for the National Register of Historic Places (NRHP) for its excellent example of 1930's Art Deco

style architecture. The building housed the Wright Field Technical Data Library, which was responsible for assembling and disseminating aeronautical information, and at the end of WWII was responsible for translating and indexing captured documents detailing German aeronautical research and development. It also housed the Army Aeronautical Museum, the first military aviation museum in the country. Except for the large sheet metal mechanical addition on the north side of the building added in 1966 and replacement windows, the exterior has not been significantly altered. The interior has undergone several interior modifications. Originally, all the space in the central section beyond the rotunda area was an open museum display area. The shift to office space, however, has added permanent walls, a second floor, and a dropped ceiling which hides the original skylights. However, the most ornamental spaces in the building, the foyer and rotunda, have remained unaltered. The Ohio Historic Inventory form for this facility was provided as Attachment 2 in our 13 Apr 07 letter.

The proposed work is detailed in the *Final 95% Design/Build Request for Proposal Submittal, Oct 07*, which equates to a 35% architectural design (Attachment 2). Attachment 3 contains the proposed historic restoration specifications which will be applied to this work. Attachment 4 contains pictures of the proposed work areas and the current condition of the building. Below is a summary of the proposed work:

- i. Removal of north mechanical addition
 - ii. Removal of east entrance concrete ramp and replace with ADA compliant ramp (currently 20012 does not contain any ADA compliant entrances)
 - iii. Repair or rotation of west entrance stairs
 - iv. Replacement of windows to match original historic design
 - v. Repair/cleaning of exterior structure and fixtures
 - vi. Interior restoration of historic rotunda and foyer
 - vii. Interior renovation of basement, 1st and 2nd floors; totaling 76,514 square feet
- b. Facility 20017 Interior/Exterior Renovation (Site 2): Facility 20017 was constructed in 1927 as the Radio Laboratory and is a contributing element to the Wright Field Historic District located in Area B of WPAFB. This building is significant because it was one of the original Wright Field laboratories. Aircraft radio communication and the radio compass designed to automatically fly an aircraft was developed in this building. There have been major exterior renovations/additions to the building with south, east, and west wings being added in the 1930's and 40's. The large original windows have been bricked in and replaced with smaller, modern windows. The interior has undergone several interior modifications. The building has been unoccupied since 1992 and was part of the 1994 Memorandum of Agreement (MOA) between the Air Force and OHPO titled *Concerning the Demolition of Structures Within the Wright Field Historic District, Area B Wright-Patterson Air Force Base, Ohio*. Per the MOA we are submitting this information as documentation of the Air Force's adaptive reuse of Facility 20017. This building has been identified to house one of the new BRAC missions and will be completely renovated to accommodate the new use. The Ohio Historic Inventory form for this facility was provided as Attachment 2 in our 13 Apr 07 letter.

The proposed work is detailed in the *Final 95% Design/Build Request for Proposal Submittal, Oct 07*, which equates to a 35% architectural design (Attachment 2). Attachment 3 contains the proposed historic restoration specifications which will be applied to this work.

Attachment 4 contains pictures of the proposed work areas and the current condition of the building. Below is a summary of the work:

1. Improved drainage on north side with retaining wall
 2. Replacement of windows
 3. Replace asphalt roof with standing seam metal roof
 4. Interior renovation of 1st and 2nd floors; totaling 29,840 square feet
- c. Facility 20620 Addition/Alteration (Site 3): Facility 20620 located in Area B of WPAFB was constructed in 1967 as the Electronic Warfare Research Facility and is individually eligible for the NRHP because it housed the avionics and electronics research facilities that contributed extensively to the development of stealth aircraft during the Cold War era. Since construction, the building has not been significantly altered. The Ohio Historic Inventory form for this facility was provided as Attachment 2 in our 13 Apr 07 letter.

The proposed work consists of approximately 54,000 square feet of interior renovation to the existing building and an approximate 93,000 square feet addition to the building. The current proposal is an "addition" to Building 620 that is more like a stand alone building with connections to the existing building similar to the way the north and south portions of the building are connected. The addition is proposed to be three stories, including foundations, perimeter walls, floor slabs of poured reinforced concrete, roof system, utilities and other necessary support. The interior will include secure classified information areas, lab & office areas, clean rooms, raised floors, special electrical power spaces and other electrical distribution systems. There will also be towers for transmitters/receivers that would be attached to the roof.

Currently, the exact location of the new addition has not been determined, but it will be located to the northeast or east side of 20620. The immediate surrounding area mainly consists of asphalt paved parking lots. Attachment 5 contains pictures of the proposed project site area. Because of the high level of past soil disturbance, the area the building has a very low likelihood of containing any intact historic artifacts. Should the addition be sited in the areas farther to the northeast, east, or south of 20620, prehistoric archaeological surveys of these areas were conducted by U.S. Army Construction Engineering Research Laboratory (USACERL) and Gray & Pape, Inc. in 1993 and 2002, respectively. Only one historic archaeological site (R7 T2 S11 #9) was discovered to the east of 20620, and it was determined to be ineligible for NRHP listing as a result of a Phase I historic survey performed by BHE Environmental, Inc. in Dec 2004.

- d. Facility 20838 Vivarium Addition (Site 4): Facility 20838 located in Area B of WPAFB was constructed in 1965 as a science medical research laboratory. Since it is less than 50 years old it has not been evaluated for its potential historic significance. The proposed work is a 9,000 square feet addition to the southeast side of the building consisting of reinforced concrete foundation and floor slab, structural steel frame, roof systems and includes high tech laboratory space, administrative space, and veterinary facility space. Attachment 5 contains pictures of the proposed project site area. An archaeological survey has not been conducted at the proposed construction site because of the high level of past soil disturbance and hence, the low likelihood of the presence of intact historic artifacts.

- e. Facility 20229 Religious Education Center Addition (Site 5): Facility 20229 located in Area B of WPAFB was constructed in 1974 as a child care center. Since it is less than 50 years old it has not been evaluated for its potential historic significance. The proposed work is a 2,070 square feet addition to the south side of the building consisting of reinforced concrete foundation and floor slab, structural steel frame, masonry walls, and roof system and includes classrooms, multipurpose room, kitchen, restrooms and support systems. Attachment 5 contains pictures of the proposed project site area. An archaeological survey has not been conducted at the proposed construction site because of the high level of past soil disturbance and hence, the low likelihood of the presence of intact historic artifacts.

- f. Entomology Facility (Site 6): An approximate new 2300 square feet (40' x 60') single story facility, with a 1200 square feet garden area and 6-space parking lot, designed to support insect vector research is proposed to be constructed east of historic Facility 20079 at the former site of Facility 20095 located in Area B of WPAFB. The proposed construction location lies within the southeast corner of the Wright Field Historic District boundary. Attachment 5 contains pictures of the proposed project site area. An archaeological survey has not been conducted at the proposed construction site because of the presence of former buildings and the high level of past soil disturbance and hence, the low likelihood of the presence of intact historic artifacts.

- g. Waste Storage Facility (Site 7): An approximate new 1,600 square feet single story facility designed to store non-Resource Conservation Recovery Act (RCRA), non-hazardous and Toxic Substances Control Act wastes is proposed to be constructed. It will be co-located with the current RCRA permitted treatment, storage and disposal facility, Facility 20479, located in Area B of WPAFB. The proposed construction location lies outside the southern boundary of the Wright Field Historic District. Attachment 5 contains pictures of the proposed project site area. An archaeological survey has not been conducted at the proposed construction site because of the high level of past soil disturbance and hence, the low likelihood of the presence of intact historic artifacts.

- h. USAF School of Aerospace Medicine (USAFSAM) Pipeline Student Dorm (Site 8): A proposed new 52,080 square feet three story facility, with a 50-space parking lot, to house students is proposed to be constructed in Area C of WPAFB. Additional functions include administrative office, vending, laundry, storage, lounge, work-out and outdoor recreational areas. Siting is located in the Kittyhawk area in close proximity to other existing dorms. The proposed construction location is not located adjacent to any historic buildings nor located within a historic district. Attachment 5 contains pictures of the proposed project site area. An archaeological survey has not been conducted at the proposed construction site because of the high level of past soil disturbance and hence, the low likelihood of the presence of intact historic artifacts.

- i. USAFSAM Field Training Site, Alternative 1 - Prime BEEF Training Area (Site 9) and Alternative 2 - Adjacent to Huffman Prairie Flying Field (Site 10): A remote field training site is being proposed which consists of approximately 20 acres of open, undeveloped land that is somewhat isolated from other base operations and visually screened. The site will be used to construct expeditionary training facilities and conduct medical evacuation training

scenarios. Both temporary and permanent structures (see Attachment 6) will be erected onto the site and include basic utilities such as electricity, water, sanitary, and communications. The preferred location is within the Prime BEEF Training Area, and the second alternative is in a field north of Hebble Creek Road and west of Huffman Prairie Flying Field (HPFF), both of which are located in Area C of WPAFB. Attachment 5 contains pictures of the proposed project site areas.

Prime BEEF Training Area: From the fall of 1994, through the spring of 1995, Great Lakes Archaeological Research Center, Inc. conducted a prehistoric survey of the entire Prime BEEF Training Area. Two prehistoric sites, 33 GR 923 and 33 GR 924 were discovered. In the summer of 2004, ASC Group conducted Phase II testing of the two sites, and site 33 GR 923 was determined by the Base as ineligible for NRHP listing. Based on the location and assemblage of site 33 GR 924, ASC Group concluded that the site may represent a Middle Woodland Hopewell habitation site and the Base determined the site as potentially eligible for NRHP listing. Attachment 7 contains the archaeological site survey maps. Our office has programmed for additional Phase II testing of 33 GR 924 to be conducted in FY10 to determine NRHP eligibility.

Included in the proposed installation of the training site, is the installation of approximately 1500 linear feet of sanitary waste line extending from an existing manhole located on the northern boundary of 33 GR 924, which will run north along a gravel road to the proposed USAFSAM training site within the Prime BEEF Training Area (Attachment 1, HPFF and Prime BEEF Site Map). Since the sanitary manhole is located on the boundary edge of the site, it is anticipated minimal disturbance will occur to the site as a result of the sanitary line installation.

Field adjacent to HPFF: From the fall of 1994, through the spring of 1995, Great Lakes Archaeological Research Center, Inc. conducted a prehistoric survey of an area north of Hebble Creek Road. In Oct-Dec 2001, Gray & Pape, Inc. conducted Phase I investigations in an area along the northern edge of Hebble Creek Road. No archaeological sites were identified in either survey. See Attachment 1, HPFF and Prime BEEF Site Map, for locations of surveyed areas.

3. Basis for determining no historic properties adversely affected. The only known historic property (which is potentially eligible for NRHP listing) is located within the APE's is Site 33 GR 924, which is located in the Prime BEEF Training Area. Since the sanitary manhole is located on the boundary edge of the site, it is anticipated minimal disturbance will occur to the site as a result of the sanitary line installation. However, the following protective measures will be followed to ensure that Site 33 GR 924 will not be adversely impacted by construction activities:
 - a. Prior to the start of any work, WPAFB Cultural Resources Manager (CRM) will conduct a site visit with the construction contractor to identify its location and determine an acceptable disturbance zone around the manhole. The disturbance zone will be coordinated with OHPO for concurrence.
 - b. Prior to the start of any work, the CRM will install stakes and caution tape around the disturbance zone and notify workers not to cross the tape.

- c. Once the sanitary line installation begins, the CRM will conduct weekly inspections at the site to ensure work does not encroach beyond the caution tape.

Should inadvertent discoveries of cultural resources occur during any of the ground-disturbing activities, the work will immediately cease and the base CRM will be notified. The procedures for inadvertent discoveries outlined in Section D.2.4 in our Integrated Cultural Resources Management Plan, May 2006, which include SHPO notification, will be followed. In addition, the construction contractor will be made aware of WPAFB procedures prior to the start of any construction activities.

4. Because the restoration and renovation of Facilities 20012 and 20017, and the renovation and addition to Facility 20620 is consistent with the Secretary's Standards for the Treatment of Historic Properties, it is our opinion that, in accordance with 36 CFR 800.5(b), the proposed actions will not cause adverse effects to these historic facilities. It is also our opinion that the new proposed construction of the Entomology Facility, due to it being a single story facility and located on the southeast boundary of the Wright Field Historic District, will not have an adverse impact to the historic district.
5. Based upon our past archaeological surveys, historic building evaluations, and protective measures for Site 33 GR 924, we have determined that no historic properties will be adversely impacted within these project areas. Therefore, the proposed work within the 10 project areas will not adversely affect historic or cultural resources at WPAFB. Please review the documentation we have provided and let us know whether you concur with our assessment. Should you have questions, I can be reached at (937) 257-0177, or via email at raymond.baker@wpafb.af.mil.



RAYMOND F. BAKER
Cultural Resources Manager
Operations Branch
Environmental Management Division

Attachments:

1. BRAC Project Site Maps
2. 20012 & 20017 35% Architectural Design Documents
3. 20012 & 20017 Historic Restoration Specifications
4. 20012 & 20017 Pictures
5. Proposed Project Area Site Photos
6. USAFSAM Field Training Site Structures
7. Archaeological survey maps, Sites 33 GR 923 & 924

Attachments 1 and 7 of the 30 Nov 07 letter are available upon request*, contact:

**Environmental Management Division
88 ABW/CEVO
Cultural Resources Manager
Wright-Patterson AFB
(937) 257-0177**

***following confidentiality requirements under Air Force Instruction 32-7065 (1 Jun 04; Section 4.4)
and pertinent authorities protecting cultural resources.**

Excerpt from Final 95% Design/Build RFP Submittal, Oct 07

(Equates to 35% Architectural Design)

SCOPE OF WORK FOR FACILITY 20012

Develop a Request for Proposal for design-build construction of 76,154 square feet of alterations to existing Building 12 to support the BRAC relocation of the 77th Aeronautical Systems from Brooks City Base, Texas to Wright Patterson AFB, Ohio. Building 12 will become the Acquisition Management Facility and will require a complete interior renovation of the architectural finishes and mechanical and electrical systems. Since Building 12 is eligible for historic listing, the interior and exterior historic finishes will be cleaned and repaired to the greatest extent possible. Due to the age of Building 12, it will be upgraded to the current seismic and force protection standards. Building 12 is close to a public roadway and an interior base road, 3rd Street, this will require special strengthening measures for the north and west walls.

The building exterior and interior historic rotunda and foyer renovations shall meet the requirements of the Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines for Rehabilitating Historic Building, US Department of the Interior, NPS 1992, and the Base Facility Standard (BFS).

The basement floor will be renovated into the following functional areas: common building support, common office support, and future tenant space. The building support will include mechanical rooms and chases, communication rooms (data, and siprnet), electrical rooms, a janitor's closet, and new stair towers. The common office support area includes toilet rooms. The future tenant spaces will include large open areas that will be completely refurbished with new ceilings, carpeting, and painted perimeter walls ready for a future tenant to move in and populate with systems furniture as required.

The first floor will be renovated into the following spaces: common building support, common office support, future tenant space, and the 648th Aeronautical Systems Squadron. The common building support will include mechanical chases, communication rooms (data, and siprnet), electrical rooms, a janitor's closet, and new stair towers. The common office support areas include toilet rooms, common conference rooms, a common break room and a common copier area. The future tenant spaces will include large open areas that will be completely refurbished with new ceilings, carpeting, and painted perimeter walls ready for a future tenant to move in and populate with systems furniture as required. The functional layout leaves the exterior wall on the south side free of systems furniture to allow natural light to enter the entire space.

The second floor will be renovated into the following spaces: common building support, common office support, Group Command, Contracting, Financial Management, Medical Flight, Engineering, and IT/Operations. The common building support will include mechanical chases, communication rooms (data, and siprnet), electrical rooms, a janitor's closet, and new stair towers. The common office support areas include toilet rooms, common conference rooms, a common break room and a common copier area.

There are a number of new openings that are being cut into the first and second floors to allow for relocated stairs, new mechanical shafts, and lightwells. These openings will require steel to resupport the existing floor. There are several areas where there are signs of water damage that may require structural rehabilitation once the walls are opened up. These areas include:

- The stone clad columns at the main entrance.
- The slab below the front steps.
- The wall along grid line 1 at the second floor.

Anti-terrorism/Force Protection (AT/FP) Upgrades: Since the basement of Building 12 is less than 50% exposed, it is considered to have only two stories exposed, and a progressive collapse analysis is not required. A blast consultant has been hired to provide blast forces on the building, along with preliminary

Excerpt from Final 95% Design/Build RFP Submittal, Oct 07
(Equates to 35% Architectural Design)

details and concepts for systems to resist the blast forces. The exterior walls will need to be strengthened to withstand blast pressures. The wall forces will need to be collected at each floor level and transferred to lateral load resisting elements. Shear walls will need to be added as well. In the portion of the building east of grid 4, it is doubtful that the second floor and roof have enough diaphragm capacity to collect and transfer the blast force. In addition, it is fairly certain that this portion of the building does not have a lateral load resisting system capable of resisting the blast force. Therefore, new collector elements and new shear walls or braced frames will need to be added to this portion of the building to resist the blast force.

Building 12 will have to be strengthened to withstand the closer explosive distance. The north wall and a portion of the west wall will have to be strengthened with a blast resistant panel, inner wall and the windows and frames will have to be specially designed as well. The roof will either have to be strengthened to resist the blast pressures or a secondary system will need to be installed under the existing roof and framing to capture the debris of the roof in the case of a blast event. Along with the required strengthening to the exterior envelope of Building 12, the building's structural system will need further strengthening to resist the blast pressures received by the north and west walls.

1.) The exterior renovation work will consist of the following items:

East Entrance Ramp (Photos 1 & 2)

Building 12 has no current ADA entrance. This project will include removal of the existing east entrance ramp and replacement with the construction of an ADA compliance ramp on the east side of the building and the creation of ADA compliant parking spaces in the existing parking lot northeast of the building.

Mechanical Addition (Photos 3 & 4)

The mechanical addition on the north side of the building is being demolished. There are openings that will need to be filled in, and new openings will need to be created for intake louvers.

West Entrance Stairs (Photos 5 & 6)

The main entrance stairs have wear and damage that could be repaired by reversing the stair treads. This will require further study to determine the feasibility of reversing the treads.

Concrete

Repair spalls and holes in concrete as specified (approximately 115 square feet); remove loose and deteriorated material to sound concrete; remove corrosion from and prep, prime & paint any exposed metal anchors as required; fill repair area with specified concrete; tool surface of repair flush and to match appearance of adjacent concrete. Repair cracks in concrete as specified (approximately 296 linear feet); rake cracks to provide a minimum 1#4" width and 3#8" depth reveal; provide specified patch material to match color and texture of existing concrete; tool surface of repair flush and to match appearance of adjacent stone. Remove miscellaneous abandoned anchors, fasteners and other appurtenances in vicinity (approximately 23 anchors, etc.); patch associated holes and spalls as specified; repair material shall match color and texture of existing concrete.

Brick Masonry

Mortar patch damaged brick as specified (approximately 15 bricks); mortar shall match color and texture of existing brick and/or associated pointing mortar as required. Remove and replace damaged or mismatched brick in kind (approximately 810 bricks); bricks to match shape, size and texture of existing brick; pointing mortar shall match color and texture of existing mortar as required. Remove miscellaneous metal fasteners & other appurtenances in vicinity (approximately 6 fasteners, etc.); mortar patch associated holes and spalls as specified; mortar shall match color and texture of existing brick and/or associated pointing mortar as required. Remove miscellaneous abandoned anchors in vicinity

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(approximately 45 anchors); mortar patch associated holes and spalls as specified; mortar shall match color and texture of existing brick and/or associated pointing mortar as required. Remove light fixture and all associated wiring (approximately 3 lights). Remove and salvage brick for use in brick replacement (approximately 120 square feet of brick). Area of unknown quantity of damaged and missing brick (approximately 300 square feet of brick); remove concrete block and other inappropriate infill; damaged brick is to be repaired and missing brick is to be replaced to match existing brick. Remove all miscellaneous anchors, fasteners, & other appurtenances in vicinity; mortar patch associated holes and spalls as specified; mortar shall match color and texture of existing brick and/or associated pointing mortar as required. Area of work includes patterned and corbelled brickwork.

Limestone (Photos 7 & 9)

Mortar repair spalls and holes in limestone as specified (approximately 135 spalls and holes); remove loose and deteriorated material to sound stone; fill repair area with specified patch mortar; tool surface of repair flush and to match appearance of adjacent stone; area of limestone patches are less than four (4) square inches in size. Install limestone dutchman to match adjacent limestone (approximately 87 dutchmen); remove loose and deteriorated material to sound stone; saw cut edges of damaged area to allow a tight joint between dutchman and adjacent stone; remove corrosion from and prep, prime & paint exposed metal anchors as required; area of limestone dutchman is more than (4) square inches and less than one (1) square foot in size. Mortar repair cracks in limestone as specified (approximately 30 linear feet); rake cracks to provide a minimum 1#4" width and 3#8" depth reveal; provide specified patch material to match color and texture of existing stone; tool surface of repair flush and to match appearance of adjacent stone. Repoint joints in adjacent stone as required to preserve appearance of masonry; pointing mortar shall match color and texture of existing. Remove miscellaneous abandoned anchors, fasteners and other appurtenances in vicinity (approximately 18 anchors, etc.); mortar patch associated holes and spalls as specified; repair mortars shall match color and texture of existing stone and/or associated pointing mortar as required. Reset and repoint limestone masonry where units of masonry are no longer plumb (approximately 606 square feet of limestone); deconstruct surrounding masonry and reinstall units to plumb and flush with adjacent blocks; repoint joints in adjacent stone as required to preserve appearance of masonry; pointing mortar shall match color and texture of existing. Area of unknown quantity of damaged and missing limestone (approximately 6 square feet); damaged limestone is to be repaired and missing limestone is to be replaced to match existing limestone. Remove all miscellaneous anchors, fasteners, & other appurtenances in vicinity; mortar patch associated holes and spalls as specified; repair mortars shall match color and texture of existing stone and/or associated pointing mortar as required. Replace limestone masonry units as specified (approximately 41 square feet of limestone); repoint joints in adjacent stone as required to preserve appearance of masonry; pointing mortar shall match color and texture of existing.

Masonry Cleaning (Photos 8, 10 & 11)

Masonry cleaning procedures shall adhere to the Guidelines of the Secretary of the Interior for Historic Preservation. Techniques employed for masonry cleaning shall be as outlined in "Preservation Brief No. 1 (1979) as published by the National Park Service. Types of stains to be removed from limestone masonry include: ferrous, copper, biological, and paint. Cleaning of selected areas of brick masonry includes removal of tar and mastic. The marble base in the rotunda and foyer will also be cleaned.

Copper

Repair damaged copper eave as specified (approximately 28 square feet). Straighten and repair copper downspout as specified (approximately 10 downspouts); return downspouts to plumb; repair any damaged straps and fasteners.

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Lighting Fixtures (Photos 12 & 13)

All glass to be cleaned as specified. Includes: 2 bronze light posts 7 bronze recessed overhead lights 3 aluminum pendant lights

Windows (Photo 14)

All exterior windows will meet AT/FP requirements, and will be thermal break aluminum heavy-duty commercial units with low E insulated glazing units. Window units shall simulate historic windows in design appearance consisting of applied muntins, matching profiles and muntin patterns of the original design.

Miscellaneous

Remove tree or shrub (approximately 10 trees); remove root system as required without damaging utilities and other building systems below grade.

2.) Work within the interior historic rotunda and foyer will include the following:

Flooring (Photos 15 & 16)

General: clean and buff all terrazzo floor as specified. Repair cracked terrazzo as specified (approximately 27 linear feet); remove loose and deteriorated material to sound terrazzo; fill repair area with specified patch material; tool surface of repair flush and refinish to match appearance of adjacent terrazzo. Repair damaged terrazzo at location of former museum exhibit as specified (approximately 45 square feet); remove loose and deteriorated material to sound terrazzo; fill repair area with specified patch material; tool surface of repair flush and refinish to match appearance of adjacent terrazzo. Remove miscellaneous door stops and anchors in vicinity (approximately 2 door stops); patch associated holes and damage as specified; patch shall match appearance of adjacent terrazzo. Replace aluminum electrical plate in vicinity with new brass plate (approximately 1 plate); plate to be installed flush with adjacent terrazzo. Relocate door stops and associated fasteners in vicinity (approximately 1 door stop); reuse existing fasteners. Replace carpet and vinyl base with new vinyl composition tile and base as specified (approximately 959 square feet); patch associated damage at plaster walls as specified.

Aluminum Lights (Photos 16 & 18)

General: clean and refinish all aluminum as specified. Replace broken or mismatched pane of glass (approximately 8 panes); provide and install specified glass; new glass to match the glass type, color and shape of the original.

Aluminum Doors (Photos 16 & 17)

General: clean and refinish all aluminum as specified.

Glass Skylight (Photo 19)

Restore leaded glass skylight as specified (approximately 180 square feet).

Historic Woodwork and Aluminum Restoration (Photos 16, 20 & 22)

Rotunda decorative woodwork and aluminum will be repaired, cleaned and refinished.

3.) All other interior renovation in non-historic areas (Photos 21, 23 & 24) will consist of the following:

Interior Walls – Painted GWB will be used where required.

Interior Floor Construction - All interior floors are concrete slabs. The labs will use cushioned sheet vinyl. Corridors will have VCT or sealed concrete, toilet rooms will have ceramic tile and storage will be vinyl composition tile (VCT). Refer specification for detailed listing of finishes.

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Ceilings – Ceilings for the storage areas will be exposed painted structure. Suspended acoustical tile ceilings will be furnished in all office, labs and corridor areas. Ceiling heights will be 9 feet in all areas which have suspended acoustical ceilings (unless noted otherwise).

Doors and Frames (Interior) - All interior doors will be hardwood solid core with STC rating to match wall doors installed in. The JFAN 6/9 doors will be steel doors and frames produced by a manufacturer specializing in JAFAN 6/9 door production.

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(Equates to 35% Architectural Design)

SCOPE OF WORK FOR FACILITY 20017

Develop a Request for Proposal for design-build construction of 29,840 square feet of alterations to existing Building 17 to support the BRAC relocation of the 77th Aeronautical Systems from Brooks City Base, Texas to Wright Patterson AFB, Ohio. Building 17 will be converted into laboratories and will require the removal of all interior finishes and mechanical and electrical systems. The renovation of Building 17 will provide the space for the Life Science Equipment Laboratory, the Textile Laboratory, and the Medical Laboratory all from Brooks City Base, Texas. Due to the age of Building 17, it will be upgraded to the current seismic and force protection standards.

The exterior building renovation shall meet the requirements of the Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines for Rehabilitating Historic Building, US Department of the Interior, NPS 1992, and the Base Facility Standard (BFS).

The ditch and drainage system along the north side of Building 17 will be relocated to allow positive drainage away from the north side of the building. The only sidewalk work included in this project will be the raising of the entrance sidewalk on the west end of Building 17, and the reworking of the sidewalk and steps at the northwest corner of the building to tie into the proposed retaining wall. There will be a retaining wall constructed along the north side of Building 17 to allow the ditch relocation and avoid damages to the mature trees along 'E' Street. Existing trees on both sites will be protected and will remain unless noted for removal. Existing hedges on the north side of Building 17 will be removed. Site demolition on Building 17 will be limited to sidewalk removal and excavation at the retaining wall to improve drainage away from the building. No site improvements are anticipated for Building 17 as the building meets AT/FP set back criteria. Building 17 currently has ADA compliant access on the east end of the building. Consideration will also be given to making the entrance on the west end ADA compliant. The second level of Building 17 will be used for bulk storage. An industrial lift will be installed to aid in the storage of large items.

Windows (Photos 1 & 3) – All exterior windows will meet anti-terrorism/force protection (AT/FP) requirements, and will be thermal break aluminum heavy-duty commercial units with low E insulated tinted glazing units.

Roof System (Photo 2) – will be structural standing seam metal roof which will comply with the Base Facility Standards. The capacity of the roof cannot be verified. It has been in place for over 50 years.

Interior Walls (Photos 5 & 6) – Painted GWB will be used where required.

Interior Floor Construction (Photos 5 & 6) – All interior floors are concrete slabs. The labs will use cushioned sheet vinyl. Corridors will have VCT or sealed concrete, toilet rooms will have ceramic tile and storage will be vinyl composition tile (VCT). Refer specification for detailed listing of finishes.

Ceilings (Photos 5 & 6) – Ceilings for the storage areas will be exposed painted structure. Suspended acoustical tile ceilings will be furnished in all office, labs and corridor areas. Ceiling heights will be 9 feet in all areas which have suspended acoustical ceilings (unless noted otherwise).

Doors and Frames (Interior) (Photos 5 & 6) – All interior doors will be hardwood solid core with STC rating to match wall doors installed in. The JFAN 6/9 doors will be steel doors and frames produced by a manufacturer specializing in JAFAN 6/9 door production.

INDEX

RENOVATION TO BUILDINGS 12 AND 17 WRIGHT PATTERSON AFB

HISTORIC RESTORATION SPECIFICATIONS

| SECTION NUMBER | TITLE |
|----------------|-------------------------------------|
| 02050 | Selective Historic Demolition |
| 03900 | Concrete Restoration |
| 04510 | Masonry Cleaning |
| 04520 | Masonry Restoration |
| 05740 | Historic Light Fixture Restoration |
| 06400 | Woodwork Restoration |
| 08210 | Aluminum Door and Grill Restoration |
| 08510 | Skylight Restoration |
| 09201 | Plaster Restoration |
| 09675 | Flooring Restoration |

PART 1 GENERAL**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and Division 1 Specification Sections apply to this Section.

1.02 SECTION INCLUDES

- A. Work includes, but is not limited to, the following:
 - 1. Provide all labor, materials, equipment and supervision required to complete miscellaneous selective demolition at locations as indicated on the drawings and specified herein.
 - a. Removal and disposal of selected mismatched and damaged brick masonry.
 - b. Removal and disposal of concrete block infill.
 - c. Removal and salvage of selected brick masonry as indicated on the Drawings. Salvage all brick units for reuse and store on pallets, protected from moisture and freeze-thaw damage.
 - d. Removal and salvage of existing limestone masonry. Salvage all limestone units for reuse and store on pallets, protected from moisture and freeze-thaw damage.
 - e. Removal of abandoned anchors, fasteners, and signage.
 - f. Removal and disposal of abandoned mechanical grilles, vents and louvers.
 - g. Removal and disposal of abandoned HVAC equipment.
 - h. Removal and disposal of abandoned electrical receptacles and conduit.
 - i. Removal and disposal of obsolete, mismatched and damaged door hardware.
 - j. Removal of existing interior and exterior light fixtures.
 - k. Remove and dispose of metal flagpoles and associated mounting equipment at Rotunda railing.
 - l. Remove and dispose of non-original metal railings.
 - m. Remove and dispose of non-original carpet and vinyl base.
 - n. Remove trees/shrubs that are detrimental to the building exterior.

1.03 RELATED WORK

- A. Division 1 requirements.
- B. Section 03900 – Concrete Restoration.
- C. Section 04520 – Masonry Restoration.

- D. Section 06400 – Architectural Woodwork.
- E. Section 08520 – Metal Door Restoration.
- F. Section 09200 – Plaster Restoration.
- G. Section 14240 – Passenger Elevator.

1.04 REFERENCES

- A. Comply with safety requirements for demolition, ANSI A10.6-83 and Standard 241, "Safeguarding Building Construction and Demolition Operations," 1981, National Fire Protection Association (NFPA).
- B. Applicable governmental agency rules and regulations.

1.05 SUBMITTALS

- A. Permit for transport and disposal of debris.
- B. The Contractor shall submit a site logistics plan for storage of debris and salvaged material to the Owner for review by building users.

1.06 HANDLING AND DISPOSAL OF MATERIALS:

- A. The Contractor shall dispose of all waste materials and debris off site in a timely fashion in accordance with local, state and federal environmental regulations unless otherwise directed.
- B. Materials to be salvaged for reinstallation shall be removed as carefully as possible to avoid cracking and chipping masonry units and bending or twisting of metal supports. Avoid bending or twisting metal components to be reinstalled.
- C. Proposed locations for trash dumpsters, materials stockpiles, etc. shall be approved by the Owner prior to beginning demolition work.
- D. Demolished roofing and other metals not to be salvaged shall be kept separate for recycling.

1.07 PROJECT / SITE CONDITIONS:

- A. The Contractor is responsible for protecting existing adjacent materials during the execution of the work. Provide all necessary protection and work procedures to avoid damage to existing material assemblies not a part of the work of this Section. At a minimum, the Contractor shall:
1. Perform masonry demolition in such a way as to minimize damage to adjacent masonry, stucco and flashings to remain from gouges and chipping during removals.
 2. Provide rigid protection for existing windows and doors in the demolition areas to prevent damage from debris generated by chipping, hammering and other demolition activities.
 3. Protect exposed corners, utility services and other protruding features during transport of demolished materials and debris to storage areas. Avoid damage to existing door and window openings to remain.
 4. Utility Services: Maintain existing utilities indicated to remain and protect them against damage during demolition operations. Provide temporary services as required during construction.
 5. Provide shoring, bracing, and temporary supports to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent construction to remain.
 6. Protect existing construction that is to remain from damage. Protect interior finishes from damage during removals.
 7. Provide temporary weather protection for building walls, windows, doors and roofs during interval between selective demolition operations which exposes interior of building to weather or water and subsequent construction.
 8. Protect steps from damage by equipment, scaffolding or falling debris from overhead work.
 9. Verify abandonment of all mechanical, plumbing and electrical appurtenances prior to removal.
- B. The Contractor shall cordon-off demolition areas once work has commenced to prevent access by unauthorized visitors.
- C. The Contractor shall take all necessary precautions and use whatever protective devices and materials are required to assure that dust, dirt and noise are kept to a minimum.
- D. The Contractor shall coordinate the work of this section with other exterior construction activities, including, but not limited to, masonry restoration, architectural woodwork, metal door restoration, mechanical /electrical / plumbing, site drainage, grading and utility excavation work.

- E. The Contractor shall photograph structures or features to be demolished, including the areas immediately adjacent for reference in the event of damage due to demolition activities. Submit copies of all original condition photographs to the Design Professional.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION**3.01 GENERAL:**

- A. Salvage value of removed materials, except as directed by Owner, shall accrue to the Contractor.
- B. Comply with safety requirements for demolition, ANSI A10.6-83 and Standard 241, "Safeguarding Building Construction and Demolition Operations," 1981.

3.02 PREPARATION

- A. Erect weatherproof enclosures for exterior openings. Maintain all exit requirements.
- B. Erect and maintain dust-proof curtains or partitions as required to prevent the spread of dust, etc. to other parts of the building. Remove all such temporary protection at the completion of the work.

3.03 DEMOLITION

- A. Perform demolition in an orderly and careful manner as required to accommodate new work.
- B. The Contractor shall repair all demolition performed in excess of that required at no additional cost to the Owner.
- C. Remove from site contaminated, vermin-infested or dangerous materials encountered and dispose of by safe means so as not to endanger the health of workers and the public.

- D. Immediately protect from weather and from unauthorized entrance all openings from which windows, doors or other materials have been removed. Maintain such protection continuously until the completion of new construction work.
- E. Remove demolished materials, tools and equipment from the site upon completion of the demolition work.

3.04 DEBRIS REMOVAL:

- A. Keep the premises cleaned by removing accumulations of waste materials, rubbish and debris on a daily basis. Such items shall be deposited in a dumpster and removed when full to a legal disposal site. Keep the public rights of way cleaned. Dampen debris and waste materials to reduce dust as much as possible.
- B. No burning of debris, waste material or trash will be allowed on the site.
- C. No material shall be dropped or thrown from any height. Use chutes or mechanical lifts to deposit debris directly into suitable containers or storage areas.

3.05 FIRE PROTECTION:

- A. The Contractor shall observe all local Fire department regulations and directions.
- B. Fire extinguishers shall be kept accessible at all work areas in the event of an emergency. All personnel shall be instructed in the proper methods to prevent and extinguish fires.

END OF SECTION

PART 1 GENERAL**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and Division 1 Specification Sections apply to this Section.

1.02 SECTION INCLUDES

- A. Work includes, but is not limited to, the following:
 - 1. Repair, restoration and replication of historic concrete including the following:
 - a. Patching of spalled areas.
 - b. Formed cementitious repairs.
 - c. Injection grouting of cracks.
 - 2. Spall and crack repairs to concrete landing at West Entrance.
 - 5. Spall and crack repairs to exposed foundation and retaining walls.

1.03 RELATED WORK

- A. Division 1 requirements.
- B. Section 02070 – Selective Demolition.
- C. Section 04520 – Masonry Restoration.

1.04 REFERENCES

- A. Concrete restoration shall conform to the Guidelines of the Secretary of the Interior for Historic Preservation. Techniques employed for concrete patching and repair shall be as outlined in “Preservation Brief No. 15 (September 1998) as published by the National Park Service and in the 1999 Concrete Repair Manual joint-published by the American Concrete Institute and the International Concrete Repair Institute.

1.05 SUBMITTALS

- A. The Contractor shall submit manufacturer’s product literature for all concrete repair materials including, but not limited to, cement, grout, form release agents, reinforcing and aggregate. Product literature shall demonstrate material compliance with these specifications and the standards referenced herein.

1.06 QUALITY ASSURANCE

- A. The Contractor performing the work of this Section shall have at least ten (10) years experience in the restoration of concrete surfaces and shall have completed at least three projects of similar scale and scope within the previous five (5) years.
- B. The Contractor shall prepare test panels of the following types of work:
 - 1. Corrosion spall preparation and patching, up to a maximum of 2 square feet.
 - 2. Injection grouting of cracks, up to a maximum of three linear feet.
 - 3. More than one test panel may be required to obtain approval. The Contractor shall prepare up to three test panels of each type, if required to obtain approval, without further compensation. Approved test panels shall become a part of the finished work and shall serve as the standard for all subsequent repairs.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Concrete restoration materials shall be delivered to the site in original packaging, unopened, with manufacturer's name and product identification thereon. Cementitious materials shall be protected from contamination by foreign matter and deterioration by moisture or temperature. Contaminated or deteriorated material shall not be used. Products stored longer than six months shall not be used.
- B. Concrete materials shall be stored in such a manner as not to interfere with the work of other trades involved in the project or with the Owner's site operations. The Owner shall review proposed storage locations prior to the delivery of materials.
- C. Debris, waste material and packaging debris shall be disposed of offsite in accordance with local, state and federal environmental regulations.
- D. Concrete for formed repairs to existing surfaces shall be factory-mixed and delivered to the site for immediate placement. Concrete that has achieved initial set by the time of delivery will be rejected.

1.08 PROJECT / SITE CONDITIONS

- A. Normal conditions for the work of this Section shall be when the air and surface temperatures are 40 degrees F and rising or less than 90 degrees F and falling. Outside this temperature range, hot or cold weather procedures as defined by the American Concrete Institute shall be followed.
- B. The Contractor is responsible for protecting existing adjacent materials during the execution of the work. Provide all necessary protection and work procedures to

avoid damage to existing material assemblies not a part of the work of this Section. At a minimum, the Contractor shall:

1. Minimize levels of dust during surface preparation operations including drilling, chipping and grinding.
2. Protect existing masonry surfaces, tiles, windows and exterior doors and frames during from mechanical damage and leakage during concrete restoration operations.
3. Provide visible barriers and / or warning tape around the perimeter of the work area for visitor protection. Protect nearby vehicles and adjacent structures from damage during the course of the work.
4. Concrete scrap, excess mortar, waste material, packaging and other debris associated with the repair work shall be disposed of in accordance with local, state and federal environmental regulations. Remove debris from concrete restoration work from the site on a timely basis and at the completion of the work.
5. The Contractor shall coordinate concrete restoration operations with the other trades involved in exterior restoration work including, but not limited to, masonry restoration and foundation and terrace waterproofing.

1.09 UNIT PRICING

- A. Crack injection, per linear foot, including patching of injection ports and surface fill.
- B. Small mortar patches, less than six inches square by three inches deep. Assume no reinforcing is required.
- C. Large mortar patches, per square foot by three inches deep, including surface preparation. Assume the installation of one stainless steel pin per six inch square area.

PART 2 PRODUCTS

2.01 CEMENTITIOUS MATERIALS

- A. Cementitious repair mortar for patching concrete shall be as follows:
 1. Cementitious repair mortar for repair of vertical and overhead surfaces shall be single component, rapid-setting patching compound complying with ASTM C 928 and reaching 2,000 psi in one hour. Repair mortar shall be Express Set by Conproco Corporation, Hooksett, NH 03106 (800)258-3500 or approved equal.
- B. Formed Repairs

1. Concrete shall comply with ASTM C 94, with proportions of ASTM C 150 Type I Portland cement, ASTM C 33 aggregates and water to provide 4,000 psi strength at 28 days. Concrete slump to be 4 inches. Air entrainment for exterior concrete shall be 4 to 6 percent complying with ASTM C 260. Plasticizer admixture may be added to mixture. No anti-freeze or calcium chloride additives shall be used in any concrete.

2.02 ACCESSORIES

- A. Epoxy adhesive for embedding anchors and pins shall be a high modulus epoxy resin conforming to ASTM C-881, Type I, II, IV and V, Grade 3 epoxy resin adhesives.
- B. Coating for exposed embedded reinforcing bars shall be a single-component, water-based barrier coat such as ECB as manufactured by Conproco Corp. or approved equal.
- C. Bonding agent for non-reinforced patches shall be a single-component, water-based barrier coat such as ECB as manufactured by Conproco Corp. or approved equal.
- D. Stainless steel pins for anchoring patches and shall be Type 304 stainless steel all-thread rods, 1/4" diameter. Length shall be as required by the depth of the patch. All other embedments such as eye bolts to be used for anchoring reinforcing pins and wire shall be stainless steel.
- E. Reinforcement for formed repairs shall be one or both of the following as indicated on the Drawings:
 1. Deformed Reinforcing Bars: ASTM A 615, Grade 60, epoxy coated.
 2. Welded Steel Wire Fabric: Plain type, galvanized ASTM A 185. Spacing and gauge of mesh shall be as noted in the drawings.
- F. Forms for exposed finish concrete shall be plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide straight, smooth exposed surfaces when removed.

2.03 INJECTION GROUTING

- A. Cementitious injection grout shall be Jahn M30 Micro-Injection Mortar or approved equivalent product.
- B. Injection ports and surface cracks shall be sealed with removable, non-staining clay during injection grouting.

- C. Injection ports shall be patched and cracks surface filled with the repair mortar specified in Paragraph 2.01.A.

PART 3 EXECUTION

3.01 GENERAL

- A. For repairs requiring the use of epoxy rebar coating, the ambient temperature shall be within the range recommended by the manufacturer of the barrier coating / bonding agent and in no case less than 40 degrees F.
- B. Work shall not commence when rain, snow or below-freezing temperatures are expected within the next 24 hours. All surfaces shall be free of standing water, frost and ice.

3.02 SPALL REPAIR

A. Surface Preparation

1. Remove any surface vegetation to fully expose the spall to be repaired.
2. Remove surface dirt by scrubbing with clean water and a soft bristle brush. No acidic or alkaline cleaning agents shall be employed.
3. Remove all loose concrete, corrosion products and debris using a non-ferrous wire brush. Exposed reinforcing shall be brushed back to sound metal as far as possible and coated with two barrier coats.
4. Concrete shall be chipped back to at least 3/8" behind the exposed reinforcing to provide a key for the patch. Minimum depth of patches shall be 1 inch. Edges shall be slightly undercut to secure the patch.

B. Spall Patching

1. Spalls deeper than 2 inches where no sound reinforcement remains shall require the addition of new stainless steel assemblies to support the patching material. The new reinforcement shall consist of embedded stainless steel pins epoxy grouted into the concrete. All new reinforcement must have a minimum coverage of 1½ inches of concrete.
2. Spalls less than 2 inches deep do not require additional reinforcement but shall instead receive a coating of bonding agent prior to placement of the concrete patch. Apply bonding agent in a thin layer in accordance with manufacturer's instructions. Place patching mortar within the time frame prescribed by the manufacturer.
3. Patching mortar shall be placed in layers not more than ½ inch thick. Scarify each layer, protect with plastic and allow to set but not cure. Re-wet thoroughly prior to placement of subsequent layers. Build layers out to desired profile. Finish surface with a wood float. Steel trowels are not

to be used for the final finish. Protect with plastic sheeting, re-wet periodically and allow to cure.

3.03 INJECTION GROUTING

A. Surface Preparation

1. Remove any surface vegetation to fully expose the crack to be repaired.
2. Remove surface dirt by scrubbing with clean water and a soft bristle brush. No acidic or alkaline cleaning agents shall be employed.
3. Remove all loose concrete and debris using a non-ferrous wire brush followed by compressed air.
4. Cracks to be grouted and filled with mortar shall be routed to a minimum width and depth of ¼ inch to accommodate mortar fill. The edges of the crack shall be undercut where possible.
5. The crack shall be blown clean with compressed air prior to grouting.

B. Injection Grouting

1. Seal the length of the crack to be grouted using the approved removable clay or sealant, leaving injection ports at regular intervals per the manufacturer's instructions. Seal the full length of the crack where visible on the interior to prevent flow-thru. Test the seal using an initial injection of plain water and re-seal as necessary.
2. Begin grouting at the lowest injection port, continuing until grout is visible at the next injection port. Plug the injection port and proceed to the next one. Continue grouting from bottom to top until the length of the crack is sealed. Station at least one person on the building interior to watch for leakage of the grout to the interior. Discontinue grouting if leakage appears and do not resume until seal is repaired.
3. Leave sealant in place at least until grout has attained its initial set. Remove and clean concrete surface as required. Allow grout to cure before applying final patching mortar.

C. Mortar Patching

1. The area to receive the mortar fill shall be thoroughly wetted to prevent dehydration of the mortar. Re-wet as necessary. Using the approved patching mortar, fill the crack proud and work mortar in as tightly as possible until flush with concrete surface. Remove excess mortar. Protect filled areas with plastic and re-wet periodically to allow a full cure.

3.04 FORMED REPAIRS

- #### A.
- Remove deteriorated concrete to be replaced, squaring off the opening and cutting out deteriorated reinforcing only as required to remove concrete. Where existing

reinforcing bars remain sound, leave approximately 4 inches protruding from the edges of the opening. Coat with specified epoxy.

- B. Install new reinforcing bars of the sizes indicated and spaced as shown on the Drawings. New reinforcing to be anchored in the edges of the existing slab using epoxy grout.
- C. Construct forms as required to fill the open area flush with adjacent surfaces. Exposed edges shall match the profile of the adjacent surfaces.
- D. Place new concrete in the opening, vibrating thoroughly to ensure penetration around and through all reinforcing bars. Screed surface flush with surrounding slab. Finish with a wood float to a smooth surface to receive terrace waterproofing.

3.05 CLEAN-UP

- A. Immediately remove all excess concrete from concrete surfaces surrounding the spall or crack to prevent staining. The use of acidic mortar stain removers will not be permitted.

END OF SECTION

PART 1 GENERAL**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and Division 1 Specification Sections apply to this Section.

1.02 SECTION INCLUDES

- A. Work includes, but is not limited to, the following:
 - 1. Cleaning of limestone masonry. Types of stains to be removed include:
 - a. Ferrous
 - b. Copper
 - c. Biological
 - d. Paint.
 - 2. Cleaning of selected areas of brick masonry. Types of stains to be removed include:
 - a. Tar and Mastic.
 - 3. Cleaning of marble base in rotunda and foyer.

1.03 RELATED WORK

- A. Division 1 requirements.
- B. Section 04520 – Masonry Restoration.
- C. Section 09250 – Portland Cement Plaster.
- D. Section 07900 – Sealants.
- E. Section 09900 – Painting & Finishing.

1.04 REFERENCES

- A. Masonry cleaning procedures shall adhere to the Guidelines of the Secretary of the Interior for Historic Preservation. Techniques employed for masonry cleaning shall be as outlined in “Preservation Brief No. 1 (1979) as published by the National Park Service.

1.05 QUALITY ASSURANCE

- A. The Contractor performing the work of this Section shall have a minimum of ten years experience in the cleaning of masonry materials similar to those required for this project and shall have successfully completed at least three projects of similar scope and size within the previous five years.
- B. Test Panels
 - 1. The Contractor, at locations designated by the Owner, shall prepare the following test panels for each of the cleaning methods specified for approval prior to commencing cleaning operations.
 - a. Water Soak Cleaning – Approximately 100 square feet.
 - b. Restoration Cleaner -- Approximately 50 square feet for each specified product.
 - c. Poultice Stain Removal – 1’-0” x 1’-0” of each poultice type.
 - 2. More than one test panel may be required to be acceptable for approval. The Contractor shall prepare at least three (3) test panels of each type, if necessary, without further compensation. Approved test panels shall become part of the finished work and shall serve as the quality standard for all similar work.

1.06 SUBMITTALS

- A. Sequence of Operations: The Contractor shall submit his proposed schedule and sequence of cleaning operations for review by the Owner prior to beginning work. No cleaning work shall begin until the sequence of operations is approved.
- B. Product literature: The Contractor shall submit manufacturer’s product literature for all proprietary cleaning products. Product literature shall include specification data, instructions for use and Material Safety Data Sheets.

1.07 DELIVERY, HANDLING, STORAGE AND DISPOSAL OF MATERIALS

- A. Deliver proprietary cleaning chemicals to the site in the manufacturer’s original containers with brand name and product identification information readily visible. Handle, store and protect all materials in such a manner as to prevent contamination and spillage thereof.
- B. Store proprietary cleaning products in accordance with the manufacturer’s recommendations. Do not store materials in direct sunlight.
- C. Effluent and residue from chemical cleaning agents and poultices shall be collected and disposed on in accordance with local, state and Federal environmental regulations. Alkaline or acidic runoff must be neutralized before disposal.

1.08 SITE / PROJECT CONDITIONS

- A. The work of this Section shall be executed only when the air and surface temperatures are greater than 50 degrees F and rising or less than 90 degrees F and falling or within the ranges directed by the cleaning product manufacturer, where applicable. Minimum temperature for masonry cleaning shall be expected to remain above 50 degrees F for at least 2 hours after completion of the final rinsing. In no case shall masonry cleaning be performed when freezing weather is expected within the 24 hours after completion.
- B. The Contractor is responsible for protecting existing adjacent materials during the execution of the work. Provide all necessary protection and work procedures to avoid damage to existing material assemblies not a part of the work of this Section. At a minimum, the Contractor shall:
 - 1. Protect building staff, visitors and vehicles from over-spray and wind drift during cleaning operations. Erect barricades and install yellow caution tape and signage as required to restrict access to work areas
 - 2. Protect all metal, glass and painted surfaces adjacent to areas to receive chemical cleaning using plastic, plywood, sealants or other materials as required to prevent penetration of cleaning chemicals. The Contractor shall be responsible for surface etching and other damage caused to adjacent materials.
 - 3. Protect painted masonry wall surfaces during the cleaning of the limestone masonry trim. Coordinate with the painting contractor to ensure that masonry cleaning work is complete prior to commencement of exterior painting operations.
 - 4. Poultices left in place for more than 60 minutes shall be covered with plastic to protect passersby from contact with cleaning chemicals.
 - 5. Protect garden plots and landscape vegetation from contact with masonry cleaning materials. Avoid directing runoff into these areas.

PART 2 PRODUCTS

2.01 LIMESTONE MASONRY CLEANING MATERIALS AND PROCESSES

- A. Water Soak Method: Water shall be potable, non-staining and free of soluble salts, oils, organic matter and other substances deleterious to the surfaces to be cleaned. No detergents or other agents shall be added to cleaning water unless specifically directed by the Owner.
- B. Chemical Cleaning

1. General Cleaning: Enviro-Kleen EK 2010 as manufactured by ProSoCo, Inc., Kansas City, KS 919_ 281-2700 or Architect approved equal.
 2. Limestone heavily soiled with biological growth shall be treated with one of the following products:
 - a. Bio-Klean as manufactured by ProSoCo, Inc., Kansas City, KS 66117 (919) 281-2700.
 - b. D/2 Architectural Antimicrobial as distributed by Cathedral Stone Products, Jessup, MD (800) 684-0901.
 - c. Approved equal.
- C. Stain Removal Poultices: The following products shall be employed for the removal of selected staining as indicated:
1. Rust Stains: Ferrous Stain Remover Poultice as manufactured by ProSoCo, Inc., Kansas City, KS or approved equal. Product to be mixed with Fullers earth or other diatomaceous clay or proprietary poultice powder to form a poultice.
 2. Copper Stains: T515 Copper Stain Remover as manufactured by ProSoCo, Inc., Kansas City, KS or Architect approved equal.
 3. Biological Stains: Heavily soiled areas of masonry shall be treated with Bio-Klean cleaner and activator as manufactured by ProSoCo, Inc., Kansas City, KS 66117 (919) 281-2700 or approved equal. Treated surfaces must be neutralized with Limestone and Masonry Afterwash, also by ProSoCo, Inc. or approved equal.
 4. Paint Marks: Paint stripper for removal of paint drips on masonry shall be a commercial grade thixotropic solution suitable for spray application and containing no wax and no chlorinated solvents. Acceptable paint strippers are as follows:
 - a. Back to Nature (Dynacraft Products, Manalapan, NJ.
 - b. S-301 Stripper (Cathedral Stone Products, Jessup, MD).
 - c. Architect approved equal

2.02 BRICK MASONRY CLEANING MATERIALS AND PROCESSES

- A. Chemical Cleaning.
1. ProSoCo Sure Klean Heavy Duty Detergent or approved equal - Concentrated, non-acidic detergent designed for cleaning heavily stained historic brick or granite masonry surfaces. All chemicals must be environmentally safe.
- B. Removal of Asphalt, Tar, etc.
1. Asphalt, tar, asphaltic aluminum paint, etc. shall be a product of one of the following manufacturers:

- a. Asphalt & Tar remover as manufactured by ProSoCo, Inc., Kansas City, KS 66117.
- b. Tar-Gone as manufactured by Arrow-Magnolia, Dallas, TX.
- c. Black Mastic Remover as manufactured by Dumond Chemicals, New York, NY.
- d. Approved equal.

2.03 MARBLE CLEANING MATERIALS

A. General Cleaning: Perform general cleaning with one of the following products:

1. Sure Klean Liquid Marble Cleaner (Blue Gel) as manufactured by: ProSoCo, Inc., P. O. Box 1578, Kansas City, KS 66117.
2. Ion-422 Marble Cleaner as manufactured by: Chemique, Inc., 315 N. Washington Ave., Moorestown, NJ 08057

B. Deep Cleaning

1. Sure Klean Marble Poultice as manufactured by: ProSoCo, Inc., P. O. Box 1578, Kansas City, KS 66117

C. Removal of Paint

1. Paint and Adhesive Remover: Thixotropic, non-methylene-chloride-based paint remover:
 - a. Enviro Strip as manufactured by: ProSoCo, Inc., P. O. Box 1578, Kansas City, KS 66117
 - b. Back to Nature II as manufactured by: Dynacraft Industries, Inc., 17 Sweetmans Lane, Manalapan, NJ 07726

D. Marble Polish:

1. Italian Craftsman Polishing Cream as manufactured by: Eastern Marble Supply Co., 1833 Front Street, P. O. Box 392, South Plains, NJ 07076, (908) 789-6400
2. Approved equal.

PART 3 EXECUTION

3.01 PREPARATION FOR LIMESTONE MASONRY CLEANING

- A. The Contractor shall inspect the areas to be cleaned prior to commencing operations. All open joints, anchor penetrations and other openings shall be

temporarily sealed using removable caulk to prevent penetration of water into the core of the wall.

- B. Windows and window frames shall be protected using polyethylene and temporary sealants as required during water soaking. The Contractor shall maintain at least one employee on the interior of the building to monitor window and wall conditions during cleaning. Work shall cease immediately if leakage is discovered inside the building and shall not resume until the cause is identified and corrected.
- C. The Contractor shall protect metal cornices and roofing against damage from weight of ladders, scaffolding and/or suspended cleaning apparatus and against scratching or abrasion damage from protruding parts.
- D. Masonry cleaning is to be completed prior to masonry repointing and repairs. Remove downspouts, adjoining building materials scheduled for removal and other appurtenances to ensure full access to wall surfaces. Remove all vegetation prior to cleaning. Items scheduled for reuse shall be carefully stored for reinstallation.

3.02 WATER SOAK LIMESTONE MASONRY CLEANING

- A. Using ½ inch PVC pipe and fittings as required, construct a sprinkler assembly with mist-type spray heads located approximately 2 feet apart. Assembly to be connected to a continuous water source with a timed shutoff valve for on/off cycling. Assembly to be suspended beneath the overhanging surfaces to be cleaned.
- B. Starting from the top and working downward in sections, saturate the stone surface in cycles of 4 hours on / 4 hours off for a period of 24 hours to soften soiling prior to final washing. Water flow to be approximately 20 to 25 gallons per hour. Do not point nozzles directly at joints in the masonry.
- C. After water misting is complete for a section of masonry, manually agitate heavily soiled areas and areas of high relief decoration with masonry brushes to loosen deposits. Final washing of each section shall consist of a moderate pressure wash, not to exceed 1000 psi. Rinse surfaces from top to bottom using a 45° fan-tip nozzle and a flow of approximately 4 gallons per minute. Maintain a minimum distance of 18 inches between the nozzle tip and the masonry surface.

3.03 CHEMICAL LIMESTONE MASONRY CLEANING

- A. General Cleaning

1. Cleaning of masonry walls shall proceed from the top of the wall downward to minimize streaking.
2. Apply masonry cleaning product in accordance with manufacturer's instructions and approved cleaning procedure submittal. Use tampico fiber brushes, rollers or low-pressure spray (less than 50 psi) for application. Do not use high-pressure spray equipment to apply cleaning product.
3. After completion of the appropriate dwell time, remove loosened soiling using a moderate-pressure water rinse. DO NOT allow the cleaning products to dry on masonry surfaces. Rinse surfaces from top to bottom using a 45° fan-tip nozzle with a nozzle pressure not to exceed 800 psi and a flow of approximately 4 gallons per minute. Maintain a minimum distance of 18 inches between the nozzle tip and the masonry surface.
4. After cleaning is completed, remove protective coverings from adjacent surfaces and repair any damage or staining caused by the cleaning operation to adjacent surfaces.

B. General Cleaning in areas of Heavy Biological Growth

1. Apply selected cleaning agent in accordance with manufacturer's instructions and approved test panel. Allow product to dwell on soiled surfaces to achieve optimal cleaning.
2. After completion of required dwell time, agitate with a soft bristle brush to lift and remove embedded growth. Flush surfaces with low to moderate pressure (up to 1000 psi) water rinse as required to remove staining. Repeat as necessary to remove all biological growth.

3.04 SPOT LIMESTONE MASONRY CLEANING

A Removal of Rust Stains

1. In a plastic bucket or container, combine poultice ingredients in accordance with manufacturer's printed instructions. Stir continuously until the mixture forms a smooth, wet paste.
2. Pre-wet masonry surface to be cleaned. Apply a layer of poultice paste, 1/8" to 1/4" in thickness, immediately to the stained surface. Surfaces to be cleaned should be dry and free of surface dirt and dust.
3. Leave poultice paste on the masonry surface until completely dry or for a maximum of 24 hours.
4. Once the poultice is completely dried, scrape mixture from the surface using wood, plastic or rubber spatulas. Rinse the treated area thoroughly with water and a soft brush to remove remaining residue.

B. Removal of Copper Stains

1. In a plastic bucket or container, combine poultice ingredients in accordance with manufacturer's printed instructions. Stir continuously until the mixture forms a smooth, wet paste.
2. Pre-wet masonry to be cleaned. Apply a layer of poultice paste, 1/8" to 1/4" in thickness, immediately to the stained surface. Surfaces to be cleaned should be dry and free of surface dirt and dust.
3. Leave poultice paste on the masonry surface until completely dry or for a maximum of 24 hours.
4. Once the poultice is completely dried, scrape mixture from the surface using wood, plastic or rubber spatulas. Rinse the treated area thoroughly with water and a soft brush to remove remaining residue.

C. Spot Cleaning for Biological Soiling

1. Spot cleaning to be performed only after general cleaning is completed for approximately two weeks.
2. Thoroughly wet surfaces to be treated with spot cleaner. Apply product using a synthetic brush, roller or low-pressure spray and allow it to dwell on the surface. Dwell time to be in accordance with the approved test panel.
3. After dwell time has elapsed, thoroughly rinse the surface with clean water at moderate pressure (up to 800 psi), working from the bottom up.
4. Apply neutralizing rinse and allow to dwell on the cleaned surface 3 to 5 minutes. After completion of the required dwell time, rinse the surface again with clean water at moderate pressure (up to 800 psi) working from the bottom up.

D. Removal of Paint Marks

1. Pre-wet masonry surface to be cleaned. Apply specified paint remover to spattered areas and allow to dwell until paint is softened and dissolved. Dwell time shall be as determined in the performance of the approved test panel.
2. Agitate with a bristle brush to loosen and lift deposits.
3. Flush surface with water to remove paint and stripper residue. Neutralize if required by manufacturer's instructions. Repeat application as necessary to completely remove paint marks.

3.05 PREPARATION FOR BRICK MASONRY CLEANING

A. Surface Preparation for Cleaning of Brick Masonry

1. Upon completion of paint removal as indicated, the Contractor shall examine the surfaces to be cleaned prior to commencing cleaning operations. Large cracks (1/8" or larger) and open joints discovered shall

- be temporarily filled with removable sealant to prevent penetration of cleaning solutions into the core of the wall.
2. Window and door openings shall be protected from leakage and damage from cleaning solutions by plastic sheeting or other waterproof membrane. Open joints around window frames and door frames adjacent to cleaning areas shall be filled with temporary sealant to prevent leakage.
3. Brick and stone surfaces shall be saturated with water prior to application of chemical cleaning products to prevent undesirable absorption of cleaning chemicals.

3.06 CHEMICAL BRICK MASONRY CLEANING

A. Brick Masonry Cleaning

1. Cleaning of masonry shall proceed from the bottom of the area upward to minimize streaking.
2. Apply masonry cleaning product in accordance with manufacturer's instructions and approved cleaning procedure submittal. Use tampico fiber brushes, rollers or low-pressure spray (less than 50 psi) for application. Do not use high-pressure spray equipment to apply cleaning product.
3. After completion of the appropriate dwell time, remove loosened soiling using a moderate-pressure water rinse. Do not allow the cleaning products to dry on masonry surfaces. Rinse surfaces from top to bottom using a 45° fan-tip nozzle with a nozzle pressure not to exceed 500 psi and a flow of approximately 4 gallons per minute. Maintain a minimum distance of 18 inches between the nozzle tip and the masonry surface.

3.07 SPOT CLEANING AT BRICK MASONRY

A. Removal of Mastic, Tar, Etc. from Brick Masonry

1. Clean bituminous material from surfaces of walls using wood scrapers to remove bulk of material prior to applying specified remover.
2. Clean surfaces of masonry using specified cleaning agent in accordance with manufacturer's instructions.
 - a. Pre-wet the surface with clean water.
 - b. Thoroughly rinse the surface after cleaning and apply neutralizing agent if required by manufacturer.
 - c. Keep area below stained area wet and rinsed free of cleaning residues.
 - d. Remove protective coverings from adjacent surfaces and repair any damage or staining caused by the cleaning operation to adjacent surfaces.

3.08 MARBLE CLEANING

- A. Wipe all surfaces with damp soft lint-free cloths to remove all surface dust and dirt as a preliminary operation to cleaning. Discard cloths frequently to avoid re-depositing surface dirt.
- B. Apply liquid marble cleaner full strength to surfaces using soft nylon bristle brushes.
 - 1. Allow cleaning medium to set for a minimum of 5 minutes before removal or as determined in preparation of the approved test panels. Dwell time shall not exceed 15 minutes per application. Thoroughly remove cleaning agent by rinsing with clean water applied with sponges. Rotate, rinse, and clean sponges to effect full removal with no residue.
 - 2. Repeat applications in accordance with the approved test panel procedure until marble surface is uniformly clean.
- C. Upon completion of general cleaning process, spot clean adhesive marks and paint drips using specified paint remover applied with a cotton swab. Agitate gently until residue is removed and rinse surface with clean water. Wood scrapers may be used to remove thick accumulations of the softened residue.
- D. Areas subject to frequent contact with passers-by, such as the marble wainscot cap, shall be poulticed to remove embedded oily stains.
 - 1. Follow manufacturer's instructions for mixing and formulating poultice to develop the desired plasticity and troweling consistency.
 - 2. Apply the prepared poultice mix to surfaces using plastic or wooden trowels to create a uniform 1/4" thick coating.
 - 3. Press-apply light polyethylene film to cover treated surfaces and prevent rapid and/or excessive drying of the poultice application. Seal edges of poly film with removable tape for duration of poultice operation.
 - 4. In accordance with the predetermined soil lifting period (12-24 hours) established by the approved test panel, remove protective film, and scrape off poultice using soft plastic or wood scrapers.
 - 5. Thoroughly wash surface with clean water using sponges and/or soft cloths.
 - 6. Repeat poulticing procedures where necessary to obtain complete cleaning and stain removal as required and to maintain a uniform level of cleaning between work areas. Use spot application of poultice where removal of localized soiling is necessary.
 - 7. Upon completion of all the cleaning operations, dress all existing joints to a uniform depth of 1/16" below the surface plane of the marble. Refill and dress joints to a slightly concave profile. Mask and protect the adjacent marble surfaces during this operation. Use wood or plastic tools that will not damage the adjacent sides of the joints.

3.09 MARBLE POLISHING

- A. Upon completion of all cleaning and joint grouting procedures, polish all surfaces, both flat and profiles, horizontal, vertical, and inclined.
1. Apply polishing cream with soft cloths to surfaces by hand. Use only enough polishing medium to uniformly treat the work.
 2. Hand-polish and buff the work surfaces using clean, soft, lint-free cloths. Discard cloths as they become soiled and/or loaded with polishing compound.
 3. Buff surfaces to produce an even, non-directional finish, uniformly over all areas. The effects of polishing shall not be evident in the finished surface when viewed from any angle of light condition.
 4. Repolish and buff any areas and/or surfaces as required to match sample wall panels and representative marble wall surfaces selected by the Owner.
 5. Upon completion of polishing and buffing operations, inspect all surfaces and “detail” all joints and features to remove remaining residue and debris. Use non-abrading, non-marring tools shaped for crevices and details to aid this final cleaning and detailing process.

END OF SECTION

PART 1 GENERAL**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and Division 1 Specification Sections apply to this Section.

1.02 SECTION INCLUDES

- A. Work includes, but is not limited to, the following:
 - 1. Repairs to the limestone masonry. Repairs include, but are not limited to, the following:
 - a. Repointing selected joints.
 - b. Mortar patching of minor limestone spalls.
 - c. Mortar patching of holes and spalls at location of removed appurtenances.
 - d. Removal and replacement of existing inappropriate patches.
 - e. Dutchman patching and reattachment of large limestone spalls.
 - f. Disassembly and reconstruction of limestone parapet coping components.
 - g. Cementitious crack repairs.
 - i. Furnish and install new limestone panels at portico columns.
 - 2. Repairs to brick masonry as indicated on the Drawings. Repairs include, but are not necessarily limited to, the following:
 - a. Restoration of brick masonry walls, including repointing, mortar patching, and selective brick replacement.
 - b. Removal of miscellaneous bolts, hooks, anchors and other masonry attachments and patching of holes.
 - c. Patching of brick masonry after removal and/or installation of mechanical and electrical appurtenances.
 - 3. Repairs to marble base in Rotunda and Foyer.
 - 4. Sampling of historic mortars for analysis by an approved laboratory.

1.03 RELATED WORK

- A. Division 1 requirements.
- B. Section 03900 – Concrete Restoration.

C. Section 04510 – Masonry Cleaning.

1.04 REFERENCES

- A. Masonry restoration shall conform to the Guidelines of the Secretary of the Interior for Historic Preservation. Techniques employed for masonry pointing and repair shall be as outlined in “Preservation Brief No. 2 (September 1998) as published by the National Park Service.
- B. Masonry restoration work shall comply with ACI / ASCE 530.1-88. Contractor shall maintain at least one copy of ACI / ASCE 530.1-88 on site.

1.05 SUBMITTALS

A. Restoration Materials

- 1. The Contractor shall submit product literature for all manufactured mortar and stone patching materials. Literature shall indicate compliance with the referenced material standards and these specifications and shall include, where applicable, manufacturer’s instructions for use.
- 2. The Contractor shall provide samples of the following stone and mortar patching and materials for approval by the Owner of color and texture. Submittal of these samples is in addition to the test panel installations required in this section of the specifications.
 - 1. Limestone pointing mortar.
 - 2. Limestone patching mortar.
 - 3. Limestone dutchman material.

B. New Materials

- 1. Shop Drawings: The Contractor shall submit shop drawings for all new steps, balusters and other dimension stone materials required under the work of this Section. Shop drawings shall indicate materials, dimensions, profiles, methods of attachment and other fabrication and finishing details.
- 2. Samples: The Contractor shall submit samples of new limestone and bluestone materials for review of color and texture match to the existing building. Samples should represent the natural color range of the material to be supplied. Submit at least three samples at a minimum size of 6 inches by 6 inches by 1 inch.

- C. The Contractor shall submit the name and qualifications of the laboratory to perform the analysis of the historic mortar and the method of analysis to be used for approval. Contractors with qualified personnel may complete the mortar analysis in house subject to Architect approval.
- D. Submit laboratory report from completed mortar analyses. Assume three (3) mortar types from various locations to be determined by Architect. Mortar analysis shall be completed prior to beginning test panel preparation. Analysis shall be limited to wet chemical and microscopic analysis to characterize the insoluble aggregate, determine binder-aggregate ratio, prepare a mix design for replacement mortar and identify appropriate sources for sand aggregate.

1.06 QUALITY ASSURANCE

- A. The Contractor performing the work of this Section shall have a minimum of ten years experience in restoration of historic masonry and shall have successfully completed at least three projects of similar scope within the previous five years.
- B. Test Panels: The Contractor, at locations designated by the Owner, shall prepare test panels of the following work:
 - 1. Limestone repointing -- 50 lineal feet.
 - 2. Limestone mortar patching -- Not to exceed one square foot each.
 - 3. Dutchman patching -- Not to exceed one square foot.
 - 4. Pointing and patching test panels shall be reviewed twice. The first review shall take place after the masonry joints are raked or the patch location is prepped and before pointing/patching mortar is applied. The second review will evaluate the finished installation.
 - 5. More than one test panel may be required to be acceptable for approval. The Contractor shall prepare a minimum of three test patches of each type, if necessary, without further compensation. No repointing or repair work shall begin until the required test panels are completed and approved.

1.07 DELIVERY, STORAGE AND HANDLING OF MATERIALS

- A. Deliver cementitious materials to the site in manufacturer's original packaging with brand and product identification clearly visible thereon. Handle, store and protect all materials in such a manner as to prevent deterioration or intrusion of foreign matter. Protect mortar and grout products from deterioration by moisture or temperature. Do not use material that has deteriorated or which has been

mixed with foreign matter. Bagged cement stored for more than six months shall not be used.

- B. Materials and equipment shall be stored in such a manner and in such location as not to interfere with the daily operation and maintenance of the building. Proposed material storage locations shall be reviewed and approved by the building manager prior to material delivery.
- C. Dispose of all waste packaging, mortar and stone scrap, and other debris in accordance with federal, state and local environmental laws.
- D. New dimension stone shall be shipped on pallets or in other sturdy packaging to prevent scratching, chipping or other impact and abrasion damage. Support stone pieces uniformly when rigging and handling to prevent point loading and possible breakage. Store new stone off the ground on dunnage or pallets with shims between pieces to prevent contact between stones.

1.08 PROJECT AND SITE CONDITIONS

- A. Normal conditions for the work of this Section shall be defined as when the air and surface temperatures are 40 degrees F and rising or less than 90 degrees F and falling. When temperatures are predicted to rise above or fall below this temperature range, the Contractor may proceed using approved hot and cold weather procedures as defined by the Masonry Institute of America.
- B. The Contractor is responsible for protecting existing adjacent building materials and landscape during the execution of the work. Provide all necessary protection and work procedures to avoid damage to existing material assemblies not a part of the work of this Section. At a minimum, the Contractor shall:
 - 1. Prevent penetration of dust from masonry repair operations into the building by protecting all windows, ventilation openings and HVAC equipment in the vicinity of the work area.
 - 2. Protect all window glass and frames from impact and abrasion damage from flying debris using plywood or other substantial barrier.
 - 3. When working at street level, the Contractor shall erect barricades, caution tape or other obstacles to prevent access by visitors to the work area.
 - 4. Protect slate shingle roofing and gutters during masonry repairs to chimneys. Erect protection to prevent masonry debris from dropping onto adjacent roof surfaces. Provide sufficient protection to slate roof surfaces to prevent point loading from scaffold or protective structures.

PART 2 PRODUCTS**2.01 MATERIALS****A. Pointing Materials**

1. Lime: ASTM C-207, Type S.
2. Portland Cement: ASTM C-150, Type I, non-staining and without air entrainment. Gray and white Portland cement may be combined as required to match existing mortar.
3. Sand: ASTM C-144, free of clay, silt, soluble salts and organic matter and shall match the color and texture of the original mortar sand.
4. Water: Potable and free of deleterious amounts of oil, soluble salts, alkali, acids, organic impurities or other substances, which may impair the strength or bond of the finished mortar.
5. Mortar colorant, if required to match the color of the existing mortar, shall be a standard product manufactured by Solomon Grind-Chem Service, Medusa or other approved manufacturer.

B. Mortar Patching Materials

1. Limestone: Jahn Restoration Mortar M70: As manufactured by Cathedral Stone Products, Inc., Washington, D.C. or approved equal. Color shall be selected from the manufacturer's standard range. If no suitable match can be found from the standard range then a custom color match will be required.
2. Brick: Jahn Restoration Mortar M100 Terra Cotta and Brick Repair Mortar: As manufactured by Cathedral Stone Products, Inc., Washington, D.C. or approved equal. Color shall be selected from the manufacturer's standard range. If no suitable match can be found from the standard range then a custom color match will be required.

C. Resin Patching Materials

1. Marble: Akabond 5010 UV – Knife Grade Gel Epoxy: As manufactured by Axson North America, Inc. or approved equal to be combined with mineral fill. Mineral fill shall be clean marble fines (100% passing #200 sieve) free of clay or organic impurities. More than one color will be required to match the mottled appearance of the existing stone. Colors shall be selected from the manufacturer's standard range. If no suitable

matches can be found from the standard range then a custom color match will be required.

D. Replacement Materials:

1. Indiana (oolitic) limestone complying with the requirements of ASTM C568, Category II (medium density). Obtain limestone consistent with the color and texture range of the existing material. Stones shall be sound and free from cracks, chips and other defects which may affect strength or appearance.
2. Salvaged limestone materials as may result from selective masonry demolition. Materials for reuse must be clean and without cracks or spalls.
3. Brick: ASTM C-216-91a, Grade SW, Type FBS fabricated to match the existing bricks. New brick shall match the size, shape, texture and color range of adjoining brick. New brick shall not exceed approved variations in color and texture of approved samples.
4. Salvaged brick as may result from partial removal of walls are required, the Contractor shall salvage any existing bricks which are sound and free of cracks wherever possible. All salvaged bricks shall be cleaned of loose debris and mortar.

2.02 MIXES

- | | | |
|----|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| A. | Limestone Pointing Mortar: (Type N) | 1 part by volume hydrated lime 1 part by volume Portland cement 6 parts by volume sand |
| B. | Bedding and Pointing Mortar: For Limestone (Type S) | 1/2 part by volume hydrated lime 1 part by volume Portland cement 4-1/2 parts by volume sand Colorant not to exceed 1/2 part |
| C. | Brick Pointing Mortar: (Type N) | 1 part by volume hydrated lime 1 part by volume Portland cement 6 parts by volume sand |

2.03 MIXING PROCEDURES

- A. Pointing Mortar:
1. Mix mortar in accordance with ASTM C-270.

2. Measure materials by volume or equivalent weight as indicated. Do not measure by shovel.
3. Mix ingredients in a clean mechanical batch mixer for 3 to 5 minutes.
4. Mortar shall stand for 20 minutes prior to use to allow for initial shrinkage. Place mortar in final position within two hours of mixing. Do not retemper or use partially hardened mortar.

B. Jahn Patching Mortar:

1. Mix patching mortar in accordance with the manufacturer's instructions. Add water to Jahn mortar material in a clean bucket and mix with trowel until all the dry material has been moistened. Do not mix more mortar than can be used in a 30-minute period.
2. Mortar is mixed to the proper consistency when a handful of material squeezed into a ball leaves little or no mortar residue on the hand.
3. All personnel to be involved in limestone patching work using Jahn Restoration Mortar must submit certification of completion of the Jahn Masonry Restoration course sponsored by Cathedral Stone Products, Inc.

2.04 ACCESSORY MATERIALS

- A. Stainless steel pins for anchoring patches and shall be Type 304 stainless steel all-thread rods, 1/4" diameter. Length shall be as required by the depth of the patch. All other embedments such as eye bolts to be used for anchoring reinforcing pins and wire shall be stainless steel.
- B. Epoxy adhesive for embedding anchors and pins and installing Dutchman patches shall be a high modulus epoxy resin conforming to ASTM C-881, Type I, II, IV and V, Grade 3 epoxy resin adhesives.

PART 3 EXECUTION

3.01 GENERAL

- A. Masonry cleaning shall be completed prior to beginning masonry repointing and repairs.
- B. Due to some lack of access, the construction drawings and specifications have been prepared based on a visual survey of the building conditions. Once all areas

are accessible by scaffold or other means, the Contractor shall inspect the areas of proposed work and shall note any additional conditions not shown on the contract drawings. Notify the Owner of any additional work required prior to commencing operations.

3.02 MASONRY POINTING

- A. Areas of masonry to be repointed are as designated on the Drawings. The extent of the work shall be reviewed with the Owner at the site before beginning operations.
- B. Remove all nails, hooks and surface attachments from masonry and masonry joints. Rake designated mortar material out of the joints using a chisel less than 1/4" wide or by mechanical grinding using a carborundum blade less than 1/8" wide. Prying against the arrises of the masonry units shall be avoided. Do not chip or spall the edges of the masonry. Clean all mortar from surfaces within the joint so that the new pointing bonds to the building stone rather than to old mortar.
- C. If work is found to be unacceptable, all raking will cease without additional cost to the Owner until deficiencies in tools, workmanship or methodology have been corrected to the Owner's satisfaction.
- D. Rake back a minimum of 1/2" to sound mortar. Brush, vacuum or blow joints clean with compressed air to remove dirt and debris.
- E. Apply new mortar in 1/4" thick layers, allowing each layer to reach initial set / thumbprint hardness before applying succeeding layers. Work mortar into the full depth of the joint using a flexible tool.
- F. When final layer of mortar is thumbprint hard, tool joint as required to match the existing profile. Avoid feather-edging of joints. Remove and dispose of excess mortar promptly before it can set or stain masonry. Dampen joints by misting with low pressure water.
- G. During hot weather (as defined by the Masonry Institute of America) keep joints damp for 72 hours after repointing using damp burlap, plastic or other waterproof membrane.
- H. The Contractor shall leave the masonry surfaces clean of mortar, grease or other spots. Any compounds proposed for cleaning stains shall be approved by the Owner prior to use.

3.03 REMOVAL OF EXISTING PATCHES AND PREPARATION OF SUBSTRATE

- A. Existing patches showing visible signs of failure such as cracking or delamination shall be removed and replaced. Where a single small stone requires extensive patchwork, the entire stone shall be removed back to sound material and a dutchman patch installed.
- B. Remove existing patches by manual chiseling or using a low pressure (<40 psi) pneumatic chisel. Grinding with a carborundum blade will be permitted only after review and approval of the grinding technique by the Owner. Final chipping of the corners of the area to be patched shall be done by hand.
- C. Chip damaged areas back to sound material, ensuring a uniform minimum depth of 3/4". Remove additional stone only as required to provide for a neat square patch. Back bevel the top and sides of the patch area to provide a mechanical key for the new patching material.
- D. Wash area to be patched clean of dust, grit and other debris.

3.04 MORTAR PATCHING -- LIMESTONE

- A. Thoroughly wet area to be patched to prevent suction of moisture from the patching material. Apply a slurry coat of Jahn mortar to the substrate.
- B. Install Jahn mortar patching material in lifts to build the required depth of patch in accordance with the manufacturer's published instructions. Tool surface to match the adjacent stone texture.
- C. Keep the mortar patches damp for 24 hours using damp burlap, plastic sheeting or other membrane as required.

3.05 MORTAR PATCHING -- BRICK

- A. Remove loose brick material, dirt and debris from areas to be repaired. Remove enough additional material to allow a minimum patch depth of 1/4 inch. Undercut the edges of the area to be patched to improve bonding. Thoroughly clean the area with a bristle brush and water prior to placing patching material.
- B. Place patching material in accordance with manufacturer's instructions. Work mortar into the full depth of the damaged area, particularly at the edges. Do not feather-edge patching material.
- C. When the final layer of patching material is thumbprint hard, tool to match existing surface texture and profile. Remove and dispose of excess mortar promptly before it can set or stain the masonry.

- D. Keep patched areas damp for 72 hours after completion using damp burlap, plastic or other waterproof membrane.
- E. The Contractor shall leave all patched masonry clean of mortar, grease or other spots. Cleaning compounds proposed for use on limestone masonry shall be approved by the Government prior to use.

3.06 RESIN PATCHING -- MARBLE

- A. Clean surfaces to be patched of loose debris and dust. Sand or carefully grind down burrs and other protrusions to provide a relatively smooth, uniform surface.
- B. Combine epoxy resin with mineral fill to form a thick paste. Tint epoxy resin to match the general tone of the existing stone. Mix in additional shades as required to imitate the mottled coloration of the stone.
- C. Apply with a putty knife or other flexible tool. Work adhesive into crevices and ensure full bonding with the stone surface but do not allow resin to bridge the joints between stones. Form surfaces and arrises flush and continuous with the adjacent stone. Polish to a smooth surface.
- D. Remove all excess patching material from the stone surface promptly.

3.07 DUTCHMAN PATCHING

- A. Remove damaged material from the area to be patched. Where possible, back bevel edges of opening and bevel edges of dutchman to improve mechanical key. Clean masonry backup and adjoining stones of mortar. Vacuum or rinse area free of dust and loose debris.
- B. Where stones exceed 20 square inches in area, install stainless steel pins as required to secure the unit to the existing substrate. The Contractor shall allow for 1 pin per 20 square inches of surface area to be patched. Pins shall penetrate a minimum of 1/3 the thickness of the stone to be installed but under no circumstance be allowed to penetrate beyond 1/2 the depth of the stone.
- C. The diameter of the holes for stainless steel anchor pins shall be drilled 1/8 inch greater than the diameter of the pins. The use of hammer drills is not permitted. Anchor pins in specified setting adhesive.
- D. Use lead, slate or plastic shims of the thickness required to maintain the required joint width. The use of wood shims is not permitted. Where the patch extends to the edge of the masonry unit, maintain the existing joint thickness. Joints occurring in the field of the masonry unit shall be hairline joints and shall not be

pointed out. Dry fit Dutchman to assess the snugness of the fit and adjust as required.

- E. Set dutchman straight, plumb and true to line and level in full mortar bed. Ensure head joint and vertical joints, if required, are packed full with mortar. Tool joints flush to existing stone surface profile. Surfaces mating with the existing stone shall be coated with adhesive and fitted tightly together.

3.08 MASONRY DISASSEMBLY AND RECONSTRUCTION

- A. Carefully dismantle selected areas of masonry where designated on the Drawings. Dismantle adjacent assemblies as required for access to the designated masonry, salvaging components for reuse to the greatest extent possible.
- B. Rake or grind mortar from joints to the greatest extent possible before attempted removal of the bricks and stones. Avoid excessive prying against the arrises of the selected masonry units to avoid spalling and chipping.
- C. Clean old mortar and sealants from masonry units to be reassembled.
- D. Reset masonry units to proper position, straight and plumb and true to line and level, with full mortar bed. Ensure that vertical head joints are completely filled with mortar. Rake and point as described above except at coping head joints, which shall be pointed with flexible sealant.
- E. Reinstall adjacent materials or patch in kind as required to complete the installation.

3.09 MASONRY INFILL

- A. Install masonry infill where indicated to match the depth of the surrounding walls. Cut masonry units with motor-driven saw designed to cut masonry with clean, sharp, unchipped edges. Cut units as required to provide bonding pattern shown and to fit adjoining work neatly. Use full units without cutting wherever possible.
- B. Lay masonry units in full mortar bed with full coverage for horizontal bed and vertical head joints. Rake back all mortar joints ½ inch for installation of pointing mortar.
- C. Brush, vacuum, or flush joints to remove all dirt and loose debris. Dampen joints prior to pointing to prevent suction of moisture from the pointing mortar.
- D. Where finish mortar joints are indicated, install pointing mortar in ¼ inch thick layers, allowing each layer to reach thumbprint hardness before applying the

succeeding layer. When the final layer of mortar is thumbprint hard, tool joint to match existing profile.

- E. Keep joints damp for 48 hours after pointing.

3.10 BRICK REPLACEMENT

- A. Remove individual cracked, spalled or otherwise damaged bricks where indicated without causing damage to the adjacent brickwork to remain. Replacements shall be either new matching brick or matching salvaged brick placed so as to replicate the existing joint and bond pattern.
- B. Remove all existing mortar from adjoining bricks in order to lay new brick entirely in new mortar. Clean joints of all loose mortar and flush with clean water.
- C. Ensure head and bed joints are packed full with mortar. Rake construction mortar to allow space for pointing mortar. Where bedding mortar and pointing mortar are the same, tool joints to match approval sample.

END OF SECTION

SECTION 05740

HISTORIC LIGHT FIXTURE RESTORATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Work includes, but is not limited to, the following:
1. Repair and restore bronze lamp posts at building entrance steps.
 2. Repair and restore recessed bronze light fixtures at building Portico.
 3. Repair and restore aluminum pendant light fixtures at Portico, Foyer, and second floor of Rotunda.
 4. Repair and restore aluminum sconce light fixtures at Rotunda.
 5. Repair and restore aluminum chandelier at Rotunda.
 6. Re-wire and obtain UL Label for each fixture.

1.02 RELATED SECTIONS

Section 04520 – Masonry Restoration

Section 06400 – Woodwork Restoration

Section 09201 – Plaster Restoration

Section 16500 – Electrical Wiring

1.03 REFERENCES

- A. National Association of Architectural Metal Manufacturers (NAAMM) Code of Standard practice for the Architectural Metal Industry, Publication AMP – 555, December 1992.

1.04 SUBMITTALS

- A. Product Literature:
1. Submit manufacturer's product literature for all proprietary repair and patching materials to be used in restoration of the existing light fixtures. Product literature shall include technical specifications, instructions for application and use and Material Safety Data Sheets.

1.05 QUALITY ASSURANCE

- A. The Contractor shall have a minimum of ten years experience in repair and restoration of historic metal light fixtures. He/she shall have successfully completed at least three lighting restoration projects of similar scope within the previous five years.
- B. Test Fixtures:
 - 1. The Contractor shall restore one aluminum lighting fixture and one bronze lamp post, designated by the Owner for evaluation of materials and workmanship. Restoration shall include replacing mismatched or broken glazing, cleaning all glazing, and metal repair and refinishing. The Contractor shall prepare up to three test panels without additional compensation if necessary to secure approval.
- C. Warranty:
 - 1. The Contractor shall warranty light fixture repairs and reinstallation for one year after completion of the project. Warranty shall cover materials and labor required to remove and reinstall doors as required.
- D. Approvals:
 - 1. The Contractor shall acquire Underwriters Laboratories approvals for all light fixtures in accordance with applicable code.

1.06 DELIVERY, STORAGE AND HANDLING

- A. All stored materials shall be protected from the elements in accordance with manufacturer's requirements. Store epoxy or polyester resin-based materials in a cool, dry area away from direct sunlight
- B. Protect lighting fixtures during removal, transport and handling to prevent glass breakage and mechanical damage to surfaces and finishes. All such damages shall be repaired to the satisfaction of and at no additional cost to the Owner.
- C. Identify each fixture with individual fixture numbers using temporary, removable markings. All fixtures removed shall be re-installed in their original locations and configurations.
- D. The Contractor shall coordinate with other trades directly or indirectly affected by the work of this Section including, but not limited to, hardware and metal finishing.

1.07 PROJECT / SITE CONDITIONS

- A. The Contractor is responsible for protecting existing adjacent materials during the execution of the work. Provide all necessary protection and work procedures to avoid damage to existing material assemblies not a part of the work of this Section. At a minimum, the Contractor shall:
 - 1. Protect adjacent limestone masonry, plaster and woodwork during repairs to lighting fixtures. Contractor shall repair any damage to adjoining surfaces to the satisfaction of, and at no additional cost to, the Owner.
 - 2. Protect finished floors in work areas from nicks, scratches and mechanical damage during door removal and reinstallation. Remove furnishings from the immediate work area.

PART 2 PRODUCTS

2.01 HISTORIC BRONZE LIGHT FIXTURE RESTORATION

- A. Replacement Components: Architectural Bronze UNS C38500 meeting the requirements of ASTM B 455-05. Thickness and section of extrusion shall match existing member to be replaced.
- B. Fasteners: Exposed fasteners to match existing adjacent fastener type, diameter and thread. Finish to match adjacent surfaces.
- C. Bronze Filler: Filler for bronze surfaces shall be bronze-filled epoxy such as “Bronze Putty” as manufactured by Devcon, Danvers, MA 01923 or approved equal.

2.02 HISTORIC ALUMINUM LIGHT FIXTURE RESTORATION

- A. Replacement and Patching Components: Architectural Aluminum meeting the requirements of ASTM B 209-04 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate. Thickness and section of extrusion shall match existing member to be replaced.
- B. Fasteners: Exposed fasteners to match existing adjacent fastener type, diameter and thread. Finish to match adjacent surfaces.
- C. Aluminum Filler: Filler for aluminum surfaces shall be aluminum-filled epoxy such as “Aluminum Putty (F)” as manufactured by Devcon, Danvers, MA 01923 or approved equal.

2.03 CLEANING AND POLISHING MATERIALS

- A. Refinishing Proposal: Submit a complete description of all proposed cleaning, polishing and coating procedures for bronze and aluminum work. Include proposed products, tools and processes. No work shall begin until the proposal is approved by the Owner.
- B. Water: Potable, non-staining and free of alkali, acids, soluble salts or organic matter which may discolor the metal surface.
- C. No abrasive cleaning products or application methods shall be permitted without the express written approval of the Owner. Under no circumstances will steel wool be approved for use.

2.04 GLAZING

- A. Glass for replacing broken, missing, or mismatched panes shall match original glazing of the appropriate fixture in thickness, size, shape, finish and finish pattern.

2.05 ELECTRICAL WIRING

- A. Refer to Section 16500 – Electrical Wiring.

PART 3 EXECUTION

3.01 GENERAL

- A. The Contractor shall inspect all door openings prior to beginning the work of this Section. Any conditions that may interfere with the performance of the work as specified shall be brought to the attention of the Owner immediately

3.02 HISTORIC BRONZE LIGHT FIXTURE RESTORATION

- A. Number, disconnect and remove light fixtures with care to not damage glazing.
- B. Number and remove glazing from light fixtures to prevent damage during metal restoration.
- C. Scrape all paint from bronze surfaces using hand scrapers and brushes.
- D. Repair all damage to bronze surfaces and return to smooth surface. Where bronze filler is used, tool to match adjacent forms and surfaces.
- E. Refinish bronze surfaces as specified in the refinishing proposal.
- F. Replace all mismatched and missing fasteners with new fasteners consistent with the

original.

- G. Replace broken and mismatched glass with glass to match. Reinstall glass in original location and configuration.
- H. Re-install light fixtures plumb, straight and true with no distortions.
- I. Immediately after installation, retouch any scratches or abrasions in the finished fixture surfaces. Examine all operable access doors for proper operation. Lubricate all doors with graphite lubricant.

3.03 HISTORIC ALUMINUM LIGHT FIXTURE RESTORATION

- A. Number, disconnect and remove light fixtures with care to not damage glazing.
- B. Number and remove glazing from light fixtures to prevent damage during metal restoration.
- C. Remove attached non-historic light fixtures. Fill obsolete fastener and hardware holes as required.
- D. Repair all damage to aluminum surfaces and return to smooth surface. Where aluminum filler is used, tool to match adjacent forms and surfaces.
- E. Refinish aluminum surfaces as specified in the refinishing proposal.
- F. Replace all mismatched and missing fasteners with new fasteners consistent with the original.
- G. Replace broken and mismatched glass with glass to match. Reinstall glass in original location and configuration.
- H. Re-install light fixtures plumb, straight and true with no distortions.
- I. Immediately after installation, retouch any scratches or abrasions in the finished fixture surfaces. Examine all operable access doors for proper operation. Lubricate all doors with graphite lubricant.

3.04 ELECTRICAL WIRING

- A. Refer to Section 16500 – Electrical Wiring.

END OF SECTION

PART 1 GENERAL**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY OF WORK

- A. Work includes, but is not limited to, the following:
 - 1. Clean and repair existing interior running trim and decorative millwork in Rotunda.
 - 2. Provide wood dutchman repairs at interior running trim, decorative millwork and woodwork in Rotunda.
 - 3. Clean, patch and repair existing interior wood veneer in Rotunda.
 - 4. Remove miscellaneous fasteners, electrical devices, etc. and repair associated holes in running trim, decorative millwork and veneer in Rotunda.

1.03 RELATED SECTIONS

- A. Section 02070 – Selective Demolition.

1.04 REFERENCES

- A. AWI Quality Standards, Latest Edition.
- B. AHA (American Hardboard Association).
- C. APA-EWA (The Engineered Wood Association) (formerly the American Plywood Association).
- D. ASTM E 84 – Test Method for Surface Burning Characteristics of Building Materials.
- E. HPVA (Hardwood Plywood & Veneer Association) HP – American Standard for Hardwood and Decorative Plywood.
- F. Underwriters' Laboratories, Inc. (UL).

1.05 SUBMITTALS

- A. Shop drawings for the fabrication and installation of all millwork:
 - 1. Shop drawings shall include large scale plans, elevations, sections, and details of each item of work, clearly noting dimensions, materials, construction joints, thicknesses, fastening devices and finishes.
 - 2. Clearly note the work to be performed by other trade contractors including adjacent and abutting materials to which this work is to be secured.
 - 3. Submit additional details and sections as required to properly describe the materials used, and the methods for securing in place.
- B. Product Data: The Contractor shall submit product literature for all manufactured products to be used in the work of this section. Product literature shall include technical data, instructions for use and all other information as necessary to indicate products' general conformance to these specifications.
- C. Certifications for graded, but unmarked lumber or plywood attesting that materials meet the grade requirements.
- D. Samples:
 - 1. Submit 1'-0" length of each wood molding profile required.
 - 2. Submit 1'-0" length of each wood type designated to receive a transparent finish.
- E. Qualifications:
 - 1. Fabricator: Company specializing in fabricating the products specified in this section with minimum ten years related experience.
 - 2. Fabricator shall be an AWI member.
- F. Furnish certificate from the appropriate manufacturer.
 - 1. Stating that all finish carpentry has been fabricated in accordance with the AWI Quality Grade specified.
 - 2. All millwork provided in this section shall be "custom grade" and shall comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute.
 - 3. Stating that particleboard conforms to the formaldehyde emissions requirements of NPA.

- G. Furnish certification of subcontractor's AWI membership.

1.06 DELIVERY, STORAGE AND HANDLING OF MATERIALS

- A. Protect woodwork during transit, storage and handling to prevent damage, soiling and deterioration.
- B. Do not deliver or reinstall restored woodwork until wet work such as masonry cleaning and restoration, plaster and similar operations that could damage, soil or deteriorate woodwork, have been completed.
- C. Store indoors, in ventilated areas with constant minimum temperature of 60° F. and relative humidity between 25% and 55%.

1.07 WARRANTY

- A. Provide a written warranty in accordance with requirements.
- B. Warranty from the Contractor shall provide for repairing to a like-new condition or replacing finish carpentry items specified herein that exhibit defects in material and workmanship within a minimum period of two years.

1.08 PROJECT / SITE CONDITIONS

- A. Coordinate field dimensions as required with appropriate contractors, in order to proceed with shop fabrications.
- B. During and after installation of work of this section, the temperature and humidity conditions in building spaces shall be similar to what they will be after occupancy.
- C. The Contractor is responsible for protecting existing adjacent materials during the execution of the work. Provide all necessary protection and work procedures to avoid damage to existing material assemblies not a part of the work of this Section. At a minimum, the Contractor shall:
 - 1. Protect finish floors in work, storage and traffic areas with cardboard and/or kraft paper. Do not set tools or materials directly on finished wood surfaces.
 - 2. Protect door jambs and other exposed corners of work to remain in work and traffic areas with cardboard or other material or avoid damage during construction operations.

- D. The Contractor shall dispose of all waste materials, packaging and debris in accordance with local, state and federal environmental regulations. No burning of debris shall be allowed on site.
- E. Coordinate installation of new finish carpentry materials with the work of other trades including flashing and sheetmetal and painting.

PART 2 PRODUCTS

2.01 GENERAL

- A. Perform work in accordance with the current edition of the AWI Quality Standards, Custom grade except for items specifically indicated otherwise.

2.02 MATERIALS

- A. Moisture Content: Air-dry or kiln-dry lumber. The maximum moisture content at time of delivery shall be as follows:
 - 1. Interior Finish Lumber, Trim, and Millwork 1-1/4" or Less in Nominal Thickness: 12% on 85% of the pieces and 15% on remainder.
 - 2. Other Wood Products: Moisture content shall be within the ranges allowed by applicable woodworking standards.
 - 3. Moisture content for all wood within the following range: 6% to 8% for interior use.
- B. Lumber and Veneer:
 - 1. New Interior Running Trim for Transparent finish to match historic material.
 - 2. Wall Veneer:
- C. Hardware & Fasteners:
 - 1. Concealed Joints: Aligned by continuous spline or a series of wafer splines or dowels. Fastened with mechanically tight joint fasteners.
 - 2. Provide nails and screws of the types and sizes required to adequately secure the work. Fasteners shall be of material and finish appropriate to the intended use. Hot-dip galvanized fasteners shall be used for work to be exposed to the exterior.

- 3. For hardware not specified, provide sizes and types recommended by the product manufacturer. Provide hot-dipped galvanized steel where used on the exterior or exposed to moisture.
- D. Wood Repair Materials:
 - 1. Adhesives and Fillers:
 - a. Wood Glue: Carpenter's (white) glue as manufactured by Franklin, Borden or Weldwood.
 - b. Wood Filler for woodwork to receive transparent finish: Tinted filler to match the color of the wood or stainable neutral colored filler.

2.03 FABRICATION

- A. Fabricate to AWI Custom standards unless noted otherwise.
- B. Prepare all work for delivery to site, permitting passage through building openings.
- C. Shop fabricate all work to the greatest extent possible.
- D. The profiles and details of all trim and millwork shall match existing and shall be as indicated on the reviewed Shop Drawings.
- E. All dimensions are actual dimensions unless otherwise shown. Dimensions are actual when shown thus: 1" x 3-1/2". When foot and inch notations are not given, dimensions are nominal (such as 2 x 4).

2.04 CLEANING AND RESTORATION MATERIALS

- A. Surfactant: Non-ionic detergent such as Triton-X 100 as manufactured by Union Carbide or Igepal, available from Talas, New York, NY or Conservation Materials, Inc., Sparks, NV or Architect approved equal.
- B. Cleaning Agent: Mineral spirits.
- C. Water: Distilled.
- D. Consolidant: Acryloid "B72" acrylic resin as manufactured by Rohm and Haas or Architect approved equal.
- E. Solvent: Acetone
- F. Wood Filler: Hard beeswax, tinted to blend with woodwork color.

- G. Wood Filler: Non-shrink, neutral colored, stainable wood putty. Filler may be tinted during preparation using universal colors or dry pigments as recommended by the manufacturer.
- H. Sandpaper: Silicon open-faced; 600 and 1200 (microfine) grit.
- I. Solvent: Denatured Alcohol.
- J. Glue: Hide glue; gram strength 315.
- K. Tape: (Reference Product) "3M Blue". Other tapes, such as masking or duct tapes, are strictly prohibited from application to any interior finishes.

2.05 FASTENERS AND ANCHORS

- A. General:
 - 1. Material, type, size, and finish required for secure fastening for each application.
 - 2. Screws: Comply with FS FF-S-111.
 - 3. Nails: Comply with FS FF-N-105.

PART 3 EXECUTION

3.01 INSTALLATION

- A. The Contractor shall closely examine woodwork to familiarize himself with the extent of the work required. The Contractor shall meet on site, prior to undertaking work, with the Contractor and Owner to coordinate, review and schedule the work.
- B. Install work in accordance with AWI Custom Quality Standards.
- C. Install to a tolerance of 1/8" in 8 feet for plumb and level and with no variation in flushness. Notify Architect where woodwork cannot be set plumb and/or level due to existing field conditions before proceeding with the work.
- D. Anchor woodwork to blocking built-in or directly attached to substrate. Secure to ground, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Use fine finish nails for exposed nailing, countersunk and filled flush with woodwork.

- E. Verify that mechanical, electrical, and building items affecting this Section are placed and ready to receive this work.
- F. Use fixture attachments in concealed locations for wall mounted components.
- G. Use purpose-designed fixture attachments for wall-mounted components.
- H. Use concealed joint fasteners to align and secure adjoining cabinet units and counter tops.
- I. Carefully scribe work abutting other components with gaps of 1/32" maximum. Do not use additional overlay trim for this purpose.
- J. Where woodwork has to be scribed or cut to fit adjoining work, apply preservative and prime cut surfaces or repair damaged finish at cuts. Scribed woodwork shall have joints between woodwork and adjoining existing masonry or metal surfaces no greater than 1/4" wide.
- K. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners, and comply with Quality Standards for joinery.
- L. Built-up items, in addition to nailing where necessary, shall be constructed with glued joints.
- M. Construct all exterior millwork so that water cannot pass through joints. Molded work shall be coped at returns and interior angles, and shall be mitered at corners.
- N. Wide-faced miters shall be held together on back with glue and metal devices applied at the mill.
- O. Fill all holes and touch up when item is shop finished.

3.02 ERECTION TOLERANCES

- A. Maximum Variation from True Position: 1/16".
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32".

3.03 REPAIR OF EXISTING WOODWORK**A. PREPARATION****1. Conditions:**

- a. Woodwork Manufacturer and Installer shall advise Contractor of temperature and humidity requirements for woodwork and composition work installation and storage areas. Do not install woodwork or composition work until required temperature and relative humidity have been stabilized and will be maintained in installation areas. The contractor and installer shall monitor temperature and humidity to make sure temperature and humidity in areas of installation and storage comply with recommendations of the installer.
 - b. Condition woodwork and composition work to average prevailing humidity conditions in installation areas prior to installing.
 - c. Maintain temperature and humidity in installation area as required to maintain moisture content of installed woodwork and composition work within a 1 percent tolerance of optimum moisture content, from date of installation through remainder of construction period. Require Woodwork Manufacturer to establish optimum moisture content and required temperature and humidity conditions. The contractor and installer shall monitor temperature and humidity to make sure temperature and humidity in areas of installation and storage comply with recommendations of the installer.
2. Coordinate location of all anchoring devices to be placed into existing substrates, and furnish locations of all blocking well in advance of time finished materials are to be installed.
 3. Protect adjacent materials and assemblies to remain in place during the course of restoration work.

B. CLEANING**1. Woodwork-General:**

- a. Procedure:

- i. Dry-clean by using a soft brush and vacuuming.
- ii. Clean surface coating with an emulsion consisting of mineral spirits, distilled water, and a maximum of 2% surfactant. Apply emulsion with soft brushes and paper towels. Do not remove original antiquing.
- iii. Remove emulsion with mineral spirits and paper towels within 30 to 45 seconds of application.
- b. Clean all existing woodwork not scheduled to be stripped and refinished.

C. RESTORATION

1. General Restoration Procedures for Woodwork:

- a. Fill all existing cracks, checks, and open gaps not remedied by reassembly:
 - i. Width less than 1/16": fill with hard wax.
 - ii. Width between 1/16" and 1/8": fill with wood putty.
 - iii. Width 1/8" or greater: fill with fillet or dutchman repair.
- b. Fill all existing holes, including holes remaining from removal of hardware not to be reinstalled:
 - i. Diameter less than 3/16": fill with wood putty.
 - ii. Diameter 3/16" or greater: fill with cross-grained plug to match.
 - iii. Where several small holes are located within an area of less than 1 square inch, a single plug may be installed.
- c. Fill all existing abrasions, scratches, dents, and other superficial damage with hard wax.

- d. Reattach all loose existing moldings with hot hide glue and fine finish nails as required.
- e. Repair all major existing losses using dutchman patches.

3. Veneer Restoration and Application:

- a. Re-glue loose veneer using hot hide glue applied with a pallet knife and/or a hypodermic syringe.
- b. Clamp re-glued areas or use a vacuum bag to ensure full contact between the veneer and wood substrate without damaging the original finish.
- c. Clean up excess glue using a mineral spirit/water emulsion. Avoid prolonged exposure of the finish to water.
- d. Replace veneer losses with saw-cut veneer of matching thickness. Spliced veneer shall be cut at a 45-degree angle to the grain.
- e. Repair and re-glue counterbalance veneers, on the reverse sides of veneered panels, as required by condition.
- f. Apply veneers to window frames, device cover plates and other surfaces indicated after preparing surfaces per the glue manufacturer's recommendations.

E. STRIPPING EXISTING FINISHES

- 1. Refer to specification section 09900 Part 3 for requirements on stripping existing finishes.

F. ADJUSTMENT, CLEANING, FINISHING, AND PROTECTION

- 1. Complete the finishing work specified as work of this section, to extent not completed prior to installation.
- 2. Repair damaged and defective woodwork where possible to eliminate functional and visual defects; replace woodwork that cannot be repaired to the satisfaction of the Owner. Adjust joinery for uniform appearance.

3. Clean exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.
4. Provide final protection to ensure that work is without damage or deterioration at time of substantial completion. When installed work will be exposed to any construction activities, provide sturdy, rigid barriers, covers or other construction as needed to protect finished work from damage.

END OF SECTION

SECTION 08210 – ALUMINUM DOOR AND GRILL RESTORATION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK: The work of this Section includes, but is not necessarily limited to, the following items:

- A. Restore and refinish aluminum doors, frames, transoms and transom grilles as indicated.
- B. Restore and refinish aluminum radiator grilles.

1.02 RELATED SECTIONS

- A. Section 16500 – Historic Lighting

1.03 REFERENCES

- A. National Association of Architectural Metal Manufacturers (NAAMM) Code of Standard Practice for the Architectural Metal Industry, Publication AMP – 555, December 1992.

1.04 SUBMITTALS

- A. Product Literature: Submit manufacturer's product literature for all proprietary repair and patching materials to be used in restoration of the existing doors. Product literature shall include technical specifications, instructions for application and use and Material Safety Data Sheets.
- B. Schedule of Work: The Contractor shall submit to the Owner a proposed schedule of door restoration work, specifically door removals and closings. Do not begin door restoration work until the closure schedule has been reviewed and coordinated with the Owner.
- C. Shop Drawings: As the building is a secure facility, the Contractor shall submit to the Owner a shop drawing of the proposed temporary door closure system for use where existing doors are removed for restoration. Shop drawing shall indicate materials, fabrication and attachment details. No door removals shall occur until proposed closure system is approved.

1.05 QUALITY ASSURANCE

- A. The Contractor shall have been engaged in the restoration of metal doors, particularly aluminum, for a minimum of ten (10) years. The Contractor shall furnish a minimum of three references for projects of similar scope of work completed within the last five (5) years at the time of the bid.
- B. Test Panels: The Contractor shall restore one single-acting entrance door, designated by the

Owner for evaluation of materials and workmanship. Restoration shall include hardware replacement and surface refinishing. The Contractor shall prepare up to three test panels without additional compensation if necessary to secure approval.

- C. Warranty: The Contractor shall warranty door repairs and installation for one year after completion of the project. Warranty shall cover materials and labor required to remove and reinstall doors as required.

1.06 DELIVERY, STORAGE AND HANDLING

- A. All stored materials shall be protected from the elements in accordance with manufacturer's requirements. Store epoxy or polyester resin-based materials in a cool, dry area away from direct sunlight.
- B. Protect doors and hardware during removal, transport and handling to prevent glass breakage and mechanical damage to surfaces and finishes. All such damages shall be repaired to the satisfaction of and at no additional cost to the Owner.
- C. Identify each door with individual opening numbers which correlate with designation system used on contract drawings for doors, frames and hardware, using temporary, removable markings. All doors removed shall be re-installed in their original openings.
- D. The Contractor shall coordinate with other trades directly or indirectly affected by the work of this Section including, but not limited to, hardware, sealants and metal finishing.

1.07 PROJECT / SITE CONDITIONS

- A. The Contractor is responsible for protecting existing adjacent materials during the execution of the work. Provide all necessary protection and work procedures to avoid damage to existing material assemblies not a part of the work of this Section. At a minimum, the Contractor shall:
 - 1. Protect adjacent limestone masonry and interior woodwork during repairs to exterior doors and frames. Contractor shall repair any damage to adjoining surfaces to the satisfaction of, and at no additional cost to, the Owner.
 - 2. Door openings from which doors are removed shall be temporarily covered and secured with rigid, waterproof material to protect against the elements and prevent unauthorized access to the building. Temporary doors must remain operable for emergency egress. No holes or fasteners may be installed in the masonry without prior approval of the Owner. Removal of doors must be coordinated with the Owner prior to beginning work.
 - 3. Protect finished floors in work areas from nicks, scratches and mechanical damage during door removal and reinstallation. Remove furnishings from the immediate work area.

4. Coordinate sealant installation with the metal cleaning and refinishing and door restoration contractors to minimize disruption of the work.
- B. The Contractor shall coordinate access to restricted areas and work therein with the Owner. No personnel shall enter restricted areas without an escort provided by the Owner.
- C. The Contractor shall provide signage and barriers as required to prevent access by the public to work areas and to direct building visitors to the appropriate entrances and exits.
- D. The Contractor shall coordinate with other trades directly or indirectly affected by the work of this Section including metal refinishing and door restoration.

PART 2 - PRODUCTS

2.01 ALUMINUM RESTORATION

- A. Replacement and Patching Components: Architectural Aluminum meeting the requirements of ASTM B 209-04 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate. Thickness and section of extrusion shall match existing member to be replaced.
- B. Fasteners: Exposed fasteners to be flat-head, slotted aluminum screws to match existing adjacent screw diameter and thread. Finish to match adjacent surfaces.
- C. Aluminum Filler: Filler for aluminum surfaces shall be aluminum-filled epoxy such as "Aluminum Putty (F)" as manufactured by Devcon, Danvers, MA 01923 or approved equal.

2.02 CLEANING & POLISHING MATERIALS:

- A. Refinishing Proposal: Submit a complete description of all proposed cleaning, polishing and coating procedures for bronze and aluminum work. Include proposed products, tools and processes. No work shall begin until the proposal is approved by the Owner.
- B. General: Refinishing materials shall be as described in the approved refinishing proposal.
- C. Water: Potable, non-staining and free of alkali, acids, soluble salts or organic matter which may discolor the metal surface.
- D. No abrasive cleaning products or application methods shall be permitted without the express written approval of the Owner. Under no circumstances will steel wool be approved for use.

PART 3 - EXECUTION

3.01 GENERAL

- A. The Contractor shall inspect all door openings prior to beginning the work of this Section. Any conditions that may interfere with the performance of the work as specified shall be brought to the attention of the Owner immediately.

3.02 DOOR AND FRAME RESTORATION

- A. Remove doors from openings to allow removal and replacement of pivot and closer hardware and repair and refinishing of door surfaces. Remove aluminum transom windows and aluminum and bronze transom grilles for repair and refinishing. Remove aluminum jambs, aluminum and bronze transom spandrels, and steel frames for repair, replacement, and refinishing. Install temporary door closures as required to secure the opening.
- B. Remove all hardware for restoration or replacement. Fill obsolete fastener and hardware holes as required and refinish door surfaces as specified. Replace all mismatched and missing screws and fasteners with new fasteners consistent with the original.
- C. Refinish aluminum transom spandrels and transom panels as specified.
- D. Corroded aluminum jambs and steel bucks are to be replaced as indicated. Carefully cut members loose at joints, being careful to avoid damage to adjacent members to remain. Field measure opening prior to fabricating and installing new member. New members shall be installed straight, square and level, prior to refinishing.
- E. Re-install frames, transom spandrels, and doors plumb, level, true and straight with no distortions. Doors should fit openings neatly and operate freely.
- F. Immediately after installation, retouch any scratches or abrasions in the finished frame, transom bar, and door surfaces or on hardware.

3.03 TRANSOM WINDOW AND GRILLE RESTORATION

- A. Carefully remove existing exterior aluminum grille and aluminum transom window for repair and refinishing.
- B. Fill obsolete fastener holes as required and refinish grille surfaces as specified. Replace all mismatched and missing screws and fasteners with new fasteners consistent with the original.
- C. Carefully remove existing interior and exterior perimeter caulking materials as required for access to work areas.
- D. Remove mismatched fasteners. Replace all mismatched and missing fasteners with new

fasteners consistent with the original.

- E. Re-install transom window sashes and grilles plumb, level, true and straight with no distortions. Windows should fit openings neatly.
- F. Immediately after installation, retouch any scratches or abrasions in the finished sash and screen surfaces or on hardware.

3.04 RADIATOR GRILLE RESTORATION

- A. Carefully remove existing aluminum radiator grilles for refinishing as specified.
- B. Remove mismatched fasteners. Replace all mismatched and missing fasteners with new fasteners consistent with the original.
- C. Re-install radiator grilles plumb, level, true and straight with no distortions. Grilles should fit openings neatly.

3.05 ALUMINUM REFINISHING

- A. Refinish aluminum work in accordance with the refinishing proposal and the approved test sample.
- B. After cleaning, rinse the panel thoroughly with clear water, making sure no traces of cleaning solution remain in joints and corners. Low pressure (<500 psi) spray equipment may be used. Rinse surrounding window glass, window frames and masonry to remove oversplash from the cleaning operations.

END OF SECTION

SECTION 08510

SKYLIGHT RESTORATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Restore existing leaded glass skylight as indicated. Leaded glass window restoration will include the following:
 - 1. Restoration of existing leaded glass sash panels including glass replacement, re-leading, re-puttying and installation of new reinforcement.
 - 2. Repair and adjustment of steel sashes and frames.
 - 3. Modification of glazing bead on existing leaded glass casement windows as indicated.
 - 4. Repair, cleaning and/or replacement of existing hardware.
 - 5. Cleaning of glazing and framework.

1.02 RELATED SECTIONS

Section 09201 – Plaster Restoration

1.03 REFERENCES

- A. Steel window restoration shall conform to the Guidelines of the Secretary of the Interior for Historic Preservation. Techniques employed for steel window repair shall be as outlined in Preservation Brief No. 13 (1983) “The Repair and Thermal Upgrading of Historic Steel Windows”, as published by the National Park Service.
- B. Leaded glass restoration and replacement procedures shall conform to the Guidelines of the Secretary of the Interior for Historic Preservation. Techniques employed shall be as outlined in Preservation Brief No. 33 “The Preservation and Repair of Historic Stained and Leaded Glass”, published by the National Park Service.
- C. Stained Glass Reference and Technical Manual, 2nd edition (1992), published by the Stained Glass Association of America.

1.04 SUBMITTALS

- A. Product Literature:

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1. Submit manufacturer's product literature for all proprietary products specified for window restoration and cleaning work such as putty, cement, lead came, cleaning agents, etc. Product literature shall include specification data, Material Safety Data Sheets and instructions for storage, handling and use.

B. Samples:

1. Submit samples of lead comes and reinforcement bars.

1.05 QUALITY ASSURANCE

- A. The Contractor shall have a minimum of fifteen years experience in repair and restoration of metal windows and the repair and fabrication of leaded glass. He/she shall have successfully completed at least three window restoration projects of similar scope within the previous five years.
- B. The Contractor shall provide the following warranties for window repairs:
 1. Ten (10) year warranty on materials and workmanship for leaded glass panels.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver restoration materials and proprietary products to the project site in manufacturer's or distributor's packaging, undamaged, and complete with installation instructions. Store fillers, putties and cements within the temperature range recommended by the manufacturer and away from direct sunlight.
- B. Store and transport leaded glass panels upright in sturdy crates, padded to prevent breakage. Store existing and new leaded glass panels off the ground, under cover and protected from damage by weather and construction activities.

1.07 PROJECT / SITE CONDITIONS

- A. The work of this Section is to be executed only when the air and surface temperatures are at least 40 degrees Fahrenheit.
- B. Do not undertake the restoration of windows until masonry restoration and cleaning have been completed. The Contractor shall coordinate work involving other trades so as not to delay the project schedule.
- C. The Contractor is responsible for protecting existing adjacent materials during the

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execution of the work. Provide all necessary protection and work procedures to avoid damage to existing material assemblies not a part of the work of this Section. At a minimum, the Contractor shall:

- D. The Contractor shall be responsible for disposal of waste materials and other debris associated with the work of this Section in accordance with local, state and federal environmental regulations.

PART 2 PRODUCTS

2.01 LEADED GLASS RESTORATION

- A. Restoration Lead Came: ASTM B29-84, comprised of trace elements of tin, antimony, copper and silver as fabricated by White Metal Rolling and Stamping Corp., North Walpole, NH or approved equal.
 - 1. Came size:
 - a. Flange width: To match existing lead.
 - b. Heart width: To match existing lead.
- B. Reinforcing Bars: to match existing material and profile.
- C. Solder: Comprised of 60% tin and 40% lead, Fed. Spec. QQS-571E.
- D. Flux: Rosin or stearine type.
- E. Glazing Cement:
 - 1. Mix in appropriate portions to include the following:
 - a. Plaster of Paris.
 - b. Boiled linseed oil.
 - c. Lamp black
 - 2. The use of paint thinner to thin glazing cement should be kept to a minimum.
 - 3. Remove glazing cement residue with whiting.
- F. Glazing Clips: Spring steel
- G. Putty: Stiff, organic, oil-based glazier's putty.

PART 3 EXECUTION

3.01 GENERAL

- A. The extent of the window restoration work shall be reviewed with the Owner on site prior to beginning operations. Contractor shall submit window schedule, including verified field dimensions and hardware inventory prior to beginning work.
- B. Window frames may be removed for restoration only as indicated. Sashes may be removed from frames for repair as required.

3.02 METAL FRAME RESTORATION

- A. Remove leaded glass panels prior to adjusting frames. Remove existing perimeter glazing beads and clips and scrape existing putty to free panels. Perimeter leads may be cut to facilitate removal. Do not pry against the glazing rabbet.
- B. Straighten bent or twisted members as required, leaving frames flat, level and true. Verify secure attachment of metal frame to metal structure. Tighten / re-anchor frame anchor screws as required.
- C. Scrape metal sashes, frames and sub-frames clean of dirt, rust, and loose paint. Techniques to be used shall not damage existing metal frames, sash or plaster surround. Patch holes and corroded areas with specified epoxy compound.
- D. Refinish visible aluminum frame members as specified in Section 08210 – Aluminum Door and Grill Restoration.

3.03 LEADED GLASS RESTORATION

- A. All leaded glass panels shall be removed and all repair and restoration work shall be performed on a bench. No work shall be performed in situ.
- B. Lead Came Repair: Repair lead comes in accordance with the following general guidelines:
 - 1. Where hairline fractures occur at solder joints, resolder.
 - 2. At severely damaged areas, remove full section of came, replace with new lead and solder joints. Lead comes must meet and overlap at joints. Do not butt leads together. Lap flanges of intersecting leads to form double thickness at joints.

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3. Where numerous segments of lead must be replaced, interweave new lead segments to increase strength of the repaired area.
 4. At edges, size perimeter lead so that glazing rabbet overlaps the heart of the perimeter came.
- C. Reinforcement: Install new horizontal reinforcement bars on the interior surface of the leaded glass panels in accordance with the following general guidelines:
1. Reinforcement shall be installed behind leads so as not to be visible from below.
 2. Install reinforcing bar stock with narrow edge against the lead came. Reinforcing bars shall be soldered to the lead came at each joint location to ensure full support across the width of the panel.
 3. Ends of reinforcing bars shall overlap the sash frame by at least ¼". Spot weld to frame to strengthen sash.

END OF SECTION

PART 1 GENERAL**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and Division 1 Specification Sections apply to this Section.

1.02 SECTION INCLUDES

- A. Work includes, but is not limited to, the following:
 - 1. Repair and restore existing flat wall and ceiling plaster in Rotunda and foyer.
 - 2. Install new flat three-coat wall and ceiling plaster in Rotunda and foyer.
 - 3. Repair of existing plaster includes, but is not limited to, the following:
 - a. Patch existing damage to flat three-coat wall and ceiling plaster in Rotunda and foyer.
 - b. Patch existing plaster surface where existing air devices and electrical, data, and communication outlets have been removed in Rotunda and foyer.
 - c. Lath required for patch of existing plaster and for new plaster in Rotunda and foyer.
 - 4. Provide all work associated with repair and restoration of existing ornamental plaster in Rotunda and foyer.
 - 5. Repair of all existing ornamental plaster includes, but is not limited to, the following:
 - a. Repair existing plaster cornices and medallions in Rotunda and foyer.
 - b. Repair and restore existing cast plasterwork in Rotunda and foyer.

1.03 RELATED WORK

- A. Division 1 requirements

1.04 REFERENCES

- A. ASTM C 841 - Installation of Interior Lathing and Furring.
- B. ASTM C 842 - Application of Interior Gypsum Plaster.
- C. ASTM C-28-96e1 - Standard Specification for Gypsum Plasters
- D. ASTM ML/SFA - Specifications for Metal Lathing and Furring.
- E. ASTM C-206-84 (1997) - Standard Specification for Finishing Hydrated Lime

- F. Plaster repair and restoration work shall be completed in accordance with the general requirements and practices set forth in Preservation Brief 21 Repairing Historic Flat Plaster-Walls and Ceilings by Marylee MacDonald, published by the US Department of the Interior, National Park Service, 1989.

1.05 QUALITY ASSURANCE

- A. Contractor Qualifications: The Contractor performing the work of this Section shall have a minimum of fifteen (15) years experience in the repair and restoration of historic plaster. The Contractor shall have completed at least three projects of similar scope and scale within the previous five (5) years.
- B. The Contractor shall prepare the following test panels in place at locations designated by the Owner for approval of profile match and workmanship:
 - 1. Preparation of samples shall include removal of existing damaged plaster and installation of new work to match adjacent surfaces.
 - 2. Prepare one test panel of flat ceiling plaster not to exceed ten square feet
 - 3. Approximately five (5) linear feet of plaster crack repair at a location as designated by the Owner.
 - 4. Preparation of more than one test panel may be required to obtain approval. The Contractor shall prepare up to three test panels as required without further compensation. Approved test panels may become part of the finished work and shall serve as the standard for all subsequent similar work.

1.06 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for new plaster and plaster repair materials, lath, and accessories including admixtures such as adhesives, patching compounds, etc.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver plaster materials to the job site in original unopened packages with manufacturer's name and brand thereon. Previously opened bags and containers of material will be rejected.
- B. Materials shall be stored in such a manner so as not to interfere with the scheduled operations and daily maintenance of the building. Proposed material storage locations shall be approved by the building maintenance supervisor prior to material delivery.
- C. Storage and Protection: Store materials off the ground and with suitable protection from moisture, direct sunlight and accidental impact. Protect all materials from damage until used. Do not use degraded or contaminated materials.

1.08 PROJECT CONDITIONS

- A. The work of this Section is to be executed only when the air and surface temperatures are 40 degrees F and rising or less than 90 degrees F and falling.
- B. The Contractor is responsible for protecting existing adjacent materials during the execution of the work. Provide all necessary protection and work procedures to avoid damage to existing material assemblies not a part of the work of this Section. At a minimum, the Contractor shall:
 - 1. Protect adjacent plaster surfaces from moisture or mechanical damage during plaster restoration work.
 - 2. Protect adjacent wall surfaces from plaster spattering and staining.
 - 3. Protect floors below work areas from dropping plaster with tarpaulins or heavy drop cloths.
 - 4. Remove, store and reinstall all adjacent wall or ceiling-mounted fixtures and appurtenances which could be damaged during this work.
- C. Coordinate lath and plaster work with other trades whose work affects or is affected by the work of this Section including, but not limited to, mechanical, electrical, plumbing, fire safety, communications, painting, carpentry and masonry.

PART 2 PRODUCTS**2.01 ACCEPTABLE MANUFACTURERS:** Subject to compliance with requirements, provide products of one of the following:

- A. Plaster:
 - 1. Gold Bond Building Products Div., National Gypsum Co.
 - 2. United States Gypsum Co.
- B. Expanded Metal Lath:
 - 1. Bostwick Steel Framing Co.
 - 2. Chapman Industries.
 - 3. Gold Bond Building Products Div., National Gypsum Co.
 - 4. Milcor Division; Inryco, Inc.
 - 5. United States Gypsum Co.
 - 6. Western Metal Lath Co.
- C. Accessories:
 - 1. Gold Bond Building Products Div., National Gypsum Co.
 - 2. Keene Corp.

3. Milcor Division; Inryco, Inc.
4. MM Systems Corp.
5. Plastic Components, Inc.
6. United States Gypsum Co.
7. Western Metal Lath Co.

2.02 GYPSUM PLASTER MATERIALS

A. Base Coat Plasters: ASTM C 28:

1. Gypsum neat plaster: Red Top Gypsum Plaster or Red Top Two-Purpose Plaster, United States Gypsum Co., or Two-Way Hardwall Plaster, National Gypsum Co.

B. Finish Coat Plasters:

1. Gypsum gauging plaster, ASTM C 28: Champion Gauging Plaster, Red Top Gypsum Plaster, or Star Gauging Plaster, United States Gypsum Co., or Super-White Gauging Plaster, National Gypsum Co.
2. Gypsum ready-mixed finished plaster, manufacturer's standard mill-mixed gauged interior finish: Red Top Finish; United States Gypsum Co.

C. Finishing Hydrated Limes: ASTM C 206, Type S.

D. Aggregates for Base Coat Plasters: ASTM C 35: sand aggregate.

2.03 LATH AND FASTENERS

A. Expanded Metal Lath: Fabricate from zinc-coated (galvanized) steel sheet to produce laths complying with ASTM C 847 for each type and configuration.

1. Type and configurations as recommended by lath manufacturer for each application.
2. Weight: 3.4 lbs. per sq. yd. except rib lath with rib depth of 3/8": 4. lbs. per sq. yd.

B. Lath Attachment Devices: Material and type required by referenced standards and recommended by lath manufacturer for secure attachment of lath to framing members and to lath.

C. Other fasteners as required for reattachment of plaster elements shall be stainless steel threaded screws of sufficient length to penetrate at least 1/2" inch into the plaster substrate.

2.04 MISCELLANEOUS MATERIALS

A. Water: Drinkable, free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

- B. Bonding Compound for Existing Surfaces: "Thorobond" as manufactured by Standard Building Products or approved equal meeting the requirements of MIL-B-19235.
- C. Adhesive for reattachment of cracked moldings: White glue as manufactured by Franklin, Borden or approved equal.
- D. Plaster washers: Perforated metal washers such as those distributed by Charles Street Supply Company, Boston, MA (800) 382-4360 or equal.
- E. Joint Compound: ASTM C-475 Ready-mixed, vinyl-based, all-purpose joint compound. Asbestos free. Joint compound shall be as manufactured by United States Gypsum Company, National Gypsum Company or approved equal.
- F. Joint tape shall be coated fiberglass mesh or pressure sensitive type as recommended by the manufacturer for temperature and humidity conditions. Fiberglass tape only to be used for crack repairs.
- G. Fibers: Non-staining synthetic, vegetable or mineral product not more than 2" long, clean and free from foreign material. Do not use asbestos fibers.

2.05 GYPSUM PLASTER MIXES

- A. Base Coats: Comply with ASTM C 842 and manufacturer's directions for application type.
 - 1. Three-Coat Work Over Metal Lath:
 - a. Scratch Coat: Gypsum fibered plaster, with job-mixed sand. Plaster shall contain not less than 0.01 percent by weight of synthetic or vegetable fibers or not less than 0.02 percent by weight of mineral fibers.
 - b. Brown Coat: Gypsum neat plaster with job-mixed sand.
- B. Finish Coats: Proportion materials in parts by dry weight.
 - 1. Troweled Finishes:
 - a. Gypsum Gauging Plaster: 1 part plaster and 2 parts lime.
 - b. Over lightweight aggregate base coats, add ½ cu. ft. of perlite finish or 50 lbs. of No. 1 white silica sand per 100 lbs. of plaster.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Repair or rebuild, as required, existing plaster areas and features where indicated on the drawings or required by field conditions. These areas and surfaces are observable, but may not be representative of all areas requiring remedial work.
- B. Inspect all surfaces for cracked or deteriorated plaster, and remove all unsound material down to sound substrate.
 - 1. Where substrate (furring) is found unsound, rebuild matching adjacent existing construction.
 - 2. Cut out cracked areas to sound material. Back cut each edge to provide a mechanical bond to new plaster.
- C. Lightly sand all new plaster surfaces in preparation for final finish.
- D. Insure that the plaster repairs are sufficiently dry before releasing the repair areas for final finishing. Verify that moisture content is 15% and below with moisture meter Model DP manufactured by Delmhurst Instrument Co. of Boomtown, New Jersey or approved equivalent.
- E. Environmental Requirements, General: Comply with requirements of referenced standards and with recommendations of plaster manufacturer for conditions before, during, and after installation.
- F. Ventilation: Ventilate spaces to remove water in excess of that required for hydration of plaster. Begin ventilation immediately after plaster is applied and continue until it sets. Comply with ventilation requirements of ASTM C 842.
- G. Protect contiguous work from soiling, spattering, moisture deterioration and other effects of plastering.

3.02 INSTALLATION OF LATHING AND FURRING, GENERAL

- A. Except where more stringent requirements are specified in this section or shown on the drawings, comply with the following:
 - 1. Gypsum plaster work: ASTM C 841.
- B. Install supplementary framing, blocking, and bracing at terminations in the work and to comply with details indicated, or if not otherwise indicated, to comply with applicable published recommendations of gypsum plaster manufacturer, or if not available, of "Gypsum Construction Handbook" published by United States Gypsum Co.
- C. Application of Metal Lath:
 - 1. Provide as base for all plaster work.
 - 2. Provide ribbed type over framing at ceilings, and otherwise where required by span.

3.03 PLASTER APPLICATION, GENERAL

- A. Repair or rebuild, as required, existing plaster areas and features where indicated on the drawings or required by field conditions. These areas and surfaces are observable, but may not be representative of all areas requiring remedial work.
- B. Match existing adjacent surface profile, thickness, and texture. Comply with other requirements of this section for related work, additional preparation, and accessories.
- C. Tolerances: Do not deviate more than 1/8" in 10'-0" from a true plane in finished plaster surfaces, except compound curved surfaces, as measured by a 10'-0" straightedge placed at any location on surface. On curved surfaces, maintain forms as shown, and transition smoothly from curved to flat surfaces.
- D. Sequence plaster application with the installation and protection of other work, so that neither will be damaged by the installation of the other.
- E. Plaster flush with metal frames and other built-in metal items or accessories, which act as, a plaster ground, unless otherwise indicated. Where plaster is not terminated at metal by casing beads, cut base coat free from metal before plaster sets, and groove finish coat at the junctures with metal.
- F. Plaster thickness: As scheduled or indicated or, if not scheduled or indicated, as required by referenced standards.
- G. Application of Plaster Types:
 - 1. For all interior work: Gypsum plaster to match surface texture of existing adjacent surfaces.
 - 2. Application Standard: ASTM C842.

3.04 FLAT PLASTER REPAIR

- A. Use plaster washers at 12-inch intervals around the perimeter of the areas to be patched to ensure attachment to the substrate. Countersink plaster washers in plaster surface and conceal using specified spackling compound.
- B. Apply new plaster in three coats as required to match the existing surface. Lap each new layer of plaster over the corresponding layer of original plaster.
 - 1. Apply gypsum / sand scratch coat, mixed in the proportion of one part gypsum plaster to 2 parts sand, with sufficient material and pressure to form full keys to the existing lath. Scratch to receive the succeeding brown coat.
 - 2. After scratch coat has set firm, apply gypsum / sand brown coat mixed in the proportion of one part gypsum plaster to two parts sand. Bring patched area to a straight, flat surface and leave rough to receive finish coat.

3. Apply gypsum / lime finish coat mixed in the proportion of one part gypsum gauging plaster to three parts lime putty. The finish shall be allowed to draw a few minutes and then shall be well troweled with water to a smooth finish free from blemishes. The thickness of finish coat shall be from 1/16" to 1/8".
 4. Bring the finished surface to a true plane with no variation in flushness between new and existing plaster. When completed, the surface shall be clean, free from blisters, pits, discoloration, cracks and other defects. In all cases, the plastering throughout is to be delivered clean and perfect in every respect, including patching of existing walls.
- C. When plaster repairs have been completed, wash down the new plaster with a zinc sulfate solution (2 lbs. per gal. of water) and allow to dry. Protect surrounding painted areas from contact with zinc sulfate solution.
- D. Where only the finish plaster is to be replaced, remove loose material to expose original brown coat. Stabilize existing finish plaster to remain around the perimeter of the repair area using plaster washers. Apply bonding agent to the substrate prior to installing new finish plaster.

3.05 CRACK REPAIR AT FLAT PLASTER

- A. Medium to wide cracks to be repaired shall be routed to a minimum width of 2 inches and cleaned of debris. Crack edges are to be back beveled to provide mechanical key to the patching material. Stabilize plaster along edges of crack with plaster washers if loose.
- B. Fill depth of crack with scratch/brown coat mixture, working plaster material in below back-beveled edges, leaving depth for a finish coat of lime plaster. Float to a straight, flat surface and leave rough for finish coat.
- C. Fine cracks shall be repaired using drywall compound and fiberglass mesh tape. Bed tape firmly in joint compound. Apply subsequent coats of joint compound to fully conceal tape. Feather-edge to match surrounding surfaces.

3.06 CRACK REPAIR AT ORNAMENTAL PLASTER

- A. Where decorative plaster elements are cracked, first verify the attachment of material on either side of the crack to be repaired. Reattach loose elements as required using mechanical fasteners before attempting crack repair.
- B. Clean debris from cracks using fine picks, knives or other narrow, flexible tools. Blow clean with compressed air.

- C. Inject a small amount of water into the crack using a spray bottle or syringe to moisten mating surfaces prior to applying infill plaster.
- D. Fill the crack with gauging plaster, using flexible tools to work repair material into the full depth of the crack. Fill crack slightly proud and allow to cure. Sand the surface of the infill flush with the adjoining surfaces.
- E. Where mating surfaces have displaced relative to one another, removal and resetting of at least one portion of the feature will be required. Removal and resetting of decorative plaster features shall be accomplished by use of hand saws and/or mechanical grinders using the narrowest blade possible. Reset using mechanical fasteners, shimming and filling as required to re-align the mating surfaces.

3.07 CUTTING AND PATCHING OF EXISTING ORNAMENTAL PLASTER

- A. Cut, patch, point-up, and repair all existing ornamental plaster as necessary to accommodate other work and to restore cracks, dents and imperfections, and as directed by the Professional. Repair or replace existing ornamental plaster where required to eliminate blisters, buckles, excessive crazing and check cracking, dry-outs, efflorescence, sweat-outs and similar defects, and where bond to the substrate has failed.
- B. Sand smooth-troweled finishes lightly to remove trowel marks and arrises. Retexture to match adjacent surfaces.

3.08 REATTACHMENT OF LOOSE ORNAMENTAL PLASTER ELEMENTS

- A. Small ornaments (less than approximately 4 square inches) may be reattached with adhesive only. Roughen mating surfaces and coat lightly with specified adhesive. Press into place and affix with masking tape or other means until adhesive is fully cured.
- B. Ornaments exceeding 4 square inches in size shall be reattached with both adhesive and mechanical fasteners. Pre-drill through decorative element and countersink fastener into surface. Install fastener through element and through substrate into lath below.

3.09 NEW ORNAMENTAL GYPSUM PLASTER

- A. Provide ornamental plaster as indicated on the drawings to match the profiles of similar existing work.
- B. Runwork: Plasterwork having a radius or molded profile with parallel edges shall be run-in-place using a template pushed through the plaster while plastic, using a sled to support, guide, and steady the template. Attach guide strips at wall and ceiling to form an edge for the pattern. After correcting any irregularities and

filling in any voids, polish the run-in-place work by making repeated passes with the template. Remove guide strips upon completion of the work.

1. Templates: Fabricate accurately to the profile to be formed from brass or aluminum sheet metal of sufficient thickness to accurately scrape the stiffening plaster without deforming. The sled shall consist of a "slipper-board" and the board to which the template is nailed.
- C. Cast work: Plaster pilaster capitals and pilaster bases and any other shapes that are not suitable to be run in place shall be precast by molding, secured into place and blended into the adjacent surfaces. Fabricate cast items by pouring and molding plaster into a rubber mold, encased in plaster for support. Provide sinkages in the work to allow for insertion of cast items.
- D. Plaster moldings to be replicated shall be shaped in place or bench-run, using specially prepared tools cut to profile from existing moldings. Molded curves shall be smooth and fillets straight and true.
- E. Corners and angles shall be carefully mitered with all moldings accurately aligned with those of the existing ornamental plaster to remain.
- F. Where bench-run moldings are used, pieces shall be securely fastened to existing joists, studs or blocking as applicable using countersunk screws. All screws and joints between new and existing work shall be pointed flush with adjacent surfaces using a mixture of gypsum and lime.

3.06 FIELD QUALITY CONTROL

- A. The Contractor is responsible for determining the most effective procedure for curing and time lapse between application of coats, based on climatic and job conditions. Plaster, which is excessively cracked or crazed due to improper timing and curing, will not be accepted. Plaster surfaces, which are, not straight, true and plumb or not curved as shown on the drawings or are not true to profile and detail, will be rejected and must be replaced.

3.07 CLEANING AND PROTECTION

- A. Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces, which are not to be plastered. Repair floors, walls and other surfaces, that have been stained, marred, or otherwise damaged by plastering work, and remove all plaster debris.

- B. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures plaster work being without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 09675 - FLOORING RESTORATION

PART ONE -- GENERAL

1.01 SCOPE OF WORK

- A. The scope of work of this Section includes, but is not limited to, the following items:
 - 1. Clean and repair terrazzo flooring in the rotunda and foyer
- B. Related work specified elsewhere:
 - 1. Section 04510 -- Masonry Cleaning

1.02 SUBMITTALS

- A. Product Literature: The Contractor shall submit the manufacturer's product literature for all proprietary cleaning products and for proposed replacement or patching materials. Product literature shall include manufacturer's technical specification data, instructions for use and Material Safety Data Sheets, as applicable.
- B. Samples: The Contractor shall submit two samples of each of the following floor patching materials for approval by the Owner of color, texture and pattern match, as applicable:
 - 1. Terrazzo patching material
 - a. Contractor shall prepare samples of mineral-filled, pigmented epoxy patching material to match the color of the existing terrazzo flooring. Samples shall be a minimum of 2 inches square by ½ inch thick and finished as specified herein.
 - b. Contractor shall prepare samples of Portland cement-based terrazzo patching material to match the color of the existing terrazzo flooring. Samples shall be a minimum of 2 inches square by ½ inch thick and finished as specified herein.
 - c. More than one sample may be required to obtain approval of color match. The Contractor shall prepare up to four samples of terrazzo patching material as required without further compensation.

- C. Schedule of operations: The flooring Contractor shall submit a schedule of operations including expected dates and duration of work in each space for review by the Owner.

1.03 QUALITY ASSURANCE

- A. The Contractor(s) performing the work of this Section shall have a minimum of ten years experience in the cleaning and repairing of the specific floor materials addressed in this Section and shall have successfully completed at least three projects of similar scope within the previous five years.

1.04 TEST PANELS

- A. The Contractor shall prepare the following test panels for approval at locations designated by the Owner:
 - 1. Terrazzo crack repair -- 1 linear foot.
- B. Preparation of more than one test panel may be required to obtain approval. The Contractor shall prepare up to three test panels as required without further compensation. Approved test panels may become part of the finished work and shall serve as the standard for all subsequent similar work.
- C. Where substitutions for specified products are proposed (where Owner approved equals are allowed), the Contractor shall prepare test panels for both the specified product and the proposed substitute product to allow for comparison prior to Owner's approval.

1.05 MATERIALS DELIVERY, HANDLING AND STORAGE

- A. Materials shall be delivered to the site in their original packaging with the manufacturer's name and product identification clearly visible thereon. Store all materials as directed by the manufacturer and in such a manner as to prevent damage or deterioration due to temperature, moisture or contamination.
 - 1. Store epoxy-based patching materials and floor adhesives within the temperature range recommended by the manufacturer and away from direct sunlight.
 - 2. Store cementitious materials above ground level. Avoid deterioration by moisture and contamination with foreign

substances. The use of deteriorated materials is not acceptable. Cementitious products stored for longer than six months will be rejected.

- B. Store all materials and equipment in such location and in such a manner as to avoid interference with the daily operation and maintenance of the building. Proposed storage locations shall be reviewed and approved by the building manager prior to the delivery of materials.

1.06 PROJECT / SITE CONDITIONS

- A. The Contractor is responsible for protecting existing adjacent materials during the execution of the work. Provide all necessary protection and work procedures to avoid damage to existing material assemblies not a part of the work of this Section. At a minimum, the Contractor shall:
 - 1. All floor mounted furnishings shall be removed, labeled and stored during the restoration of the flooring. All such items shall be reinstalled after completion of the floor refinishing work.
 - 2. Protect walls and baseboards from over-splash, bleaching, etching or staining from cleaning, stripping and refinishing products during the course of the work. The Contractor shall be responsible for making good all such damages to the satisfaction of and at no additional cost to the Owner.
 - 3. Protect all doors and door frames from staining and mechanical damage during the course of the work. The Contractor shall be responsible for making good all such damages to the satisfaction of and at no additional cost to the Owner.
 - 4. Protect existing terrazzo and bronze divider strips from damage during terrazzo crack repairs.
- B. Provide mechanical cross-ventilation during use of floor stripping chemicals. All Contractor personnel shall be supplied with the appropriate respiratory, skin and eye protection as required for the work. Building visitors shall be excluded from the work area using appropriate barriers and warning signage.
- C. The Contractor shall dispose of all excess material, waste, effluent, packaging and debris in accordance with Federal, State and Local environmental regulations.

- D. The Contractor shall perform floor stripping operations during evening hours to minimize exposure of building users and visitors to unpleasant fumes.

PART TWO -- PRODUCTS

2.01 TERRAZZO CRACK REPAIRS

- A. Cracks greater than 1/8" wide shall be routed and patched using a pigmented, mineral-filled epoxy material.
 - 1. Epoxy resin shall be a two-component product, 100% solids, non-yellowing, non-shrinking and insensitive to moisture. Resin must continue to allow between 2% and 4% elongation when cured. Epoxy may be custom-colored at the Contractor's option to facilitate matching to the existing terrazzo.
 - 2. Epoxy resin shall be Flexi-Fill 530 (previously Flexi-weld 520T) as manufactured by Edison Coatings, Inc., Waterbury, CT (203) 597-9727.
- B. Mineral fill shall consist of clean, coarse-screened marble chips, standard quarry grade product of sizes 0 and 1. Sizes shall conform to the grading and numbers adopted by the National Terrazzo and Mosaic Association (N.T.M.A.). Color and kind shall be as required to match the existing material.
- C. Pigments: Color pigments (if required) shall be non-fading, pure mineral pigments as manufactured by Solomon Grind-Chem Services, Medusa or as recommended by the epoxy resin manufacturer.
- D. Mineral fill shall be added to the epoxy resin in a ratio not to exceed 1 part by volume filler to 1 part by volume resin.

2.02 TERRAZZO PATCHING

- A. Portland Cement: ASTM C-150, Type I, non-staining and without air entrainment. Gray and white Portland cement may be combined if required to match existing cast aggregate wall panels.
- B. Mineral fill shall consist of clean, coarse-screened marble chips, standard quarry grade product of sizes 1 and 2. Sizes shall conform to the grading

and numbers adopted by the N.T.M.A. Color and kind shall be as required to match the existing material.

- C. Water: Potable and free of deleterious amounts of oil, soluble salts, alkali, acids, organic impurities or other substances which may impair the strength or bond of the finished mortar.
- D. Mortar colorant, if required to match the color of the cleaned terrazzo panels, shall be a standard product manufactured by Solomon Grind-Chem Service, Riverton Lime Co., Medusa or other approved manufacturer.
- E. Sealer shall be a penetrating siloxane such as Stand-Off Limestone and Marble Protector as manufactured by ProSoCo, Inc., Kansas City, KS or Architect approved equal. The sealer shall not alter the color or gloss of the finished terrazzo surface.

2.03 TERRAZZO CLEANING

- A. Cleaner: Chemically neutral cleaner with pH factor between 7 and 10 that is biodegradable, phosphate free, and recommended by cleaner manufacturer for use on terrazzo type.
- B. Sealer: Slip- and stain-resistant, penetrating-type sealer that is chemically neutral with pH factor between 7 and 12, does not affect color or physical properties of terrazzo type indicated, is recommended by sealer manufacturer for this use, and complies with NTMA Guide Specification for terrazzo type indicated.

PART THREE -- EXECUTION

3.01 GENERAL

- A. Floor cleaning and restoration shall not begin until after the masonry cleaning operations and overhead plaster repairs and painting are completed.
- B. Where possible, remove all display cases, flag poles and other moveable furnishings to facilitate flooring restoration.

3.02 TERRAZZO CRACK REPAIRS

- A. Preparation

1. Rout out existing cracks to be repaired to a minimum width of ¼” (full depth) and a minimum depth of ½”. Routing may be performed using a hand held grinder except where cracks terminate at existing bronze divider strips. Only hand chisels may be used at these terminations to avoid damage to the bronze divider strips.
2. Remove dust and debris from cracks to be repaired using compressed air.
3. Mask the shoulders of the crack to be filled to prevent staining of the adjacent surfaces.

B. Patching

1. Prepare epoxy resin in accordance with manufacturer’s instructions, adding mineral fill in a ratio not to exceed 1 part by volume fill to 1 part by volume resin, forming a stiff, knife grade paste. Add pigments as required to match approved samples.
2. Apply epoxy patching material using a flexible trowel or putty knife. Work material into full depth of crack, packing material tightly against terrazzo edges and bronze divider strips.
3. Press additional marble chips into the repair surface as required to ensure uniform coverage over 70% of the repair area.
4. Remove excess patching material, leaving surface flush with the adjacent terrazzo surfaces. Allow to cure 24 hours protected from abrasion and impact prior to finishing.

C. Finishing:

1. Wet sand the patched area only with successively finer abrasive grits, finishing with approximately #80 grit to match the smoothness of the surrounding surfaces. Protect adjacent terrazzo from abrasion during sanding of patched areas. Do not sand surrounding terrazzo surfaces.

3.03 TERRAZZO PATCHING

- A.** Remove loose or damaged material down to the concrete substrate, enlarging and deepening the area to be patched as required to provide sufficient mechanical key for the patching material. Area to be patched shall be cleaned free of dust and other foreign matter.

- B. Where the depth of the patch will exceed 1/2 inch, an initial layer of one part Portland cement and four parts sand shall be placed prior to the finish layer. Mix Portland cement and sand with the minimum amount of water required to produce a workable consistency. Dust the substrate with sand prior to placing the initial layer. Leave at least 1/2 inch depth for the final topping.
- C. Apply the final layer of terrazzo topping in the proportion of two parts marble chips to one part Portland cement by weight. Add pigments as required to match the existing terrazzo.
- D. Saturate the patching area with water prior to placing the finish topping. Apply the terrazzo mix flush with the surrounding floor, pressing additional marble chips into the surface. Hand trowel to an even surface. Cure for at least 72 hours before grinding and finishing.
- E. Wet grind the patched area with successively finer abrasive grits, starting with #24 grit and finishing with approximately #80 grit. Protect adjacent terrazzo from abrasion during sanding of patched areas. Do not sand surrounding terrazzo surfaces. Allow to dry completely before polishing, cleaning with a neutral cleaning solution, and applying finish sealer in accordance with manufacturer's instructions.

3.04 TERRAZZO CLEANING

- A. Wash surfaces with cleaner according to NTMA's written recommendations and manufacturer's written instructions; rinse surfaces with water and allow drying thoroughly.
- B. Seal surfaces according to NTMA's written recommendations. Apply sealer according to sealer manufacturer's written instructions.
- C. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure terrazzo is without damage or deterioration at time of Occupancy/ Utilization.

END OF SECTION

Facility 20012 Photos



Photo 1: East Façade



Photo 2: East Ramp



Photo 3: Mechanical Addition – North Façade



Photo 4: Mechanical Addition – North Façade



Photo 5: West Entrance



Photo 6: West Entrance Stairs

Facility 20012 Photos



Photo 7: Limestone Repair



Photo 8: Entry Portico – Frieze Detail

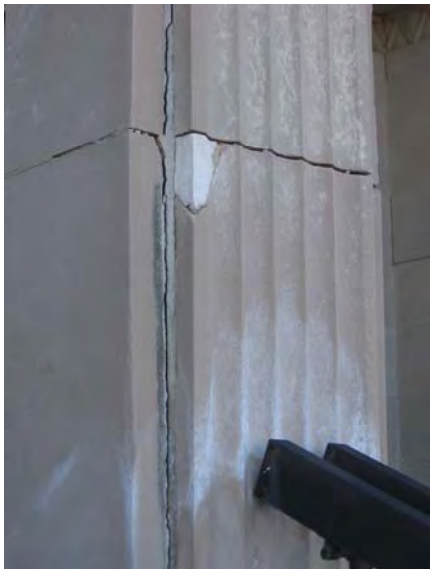


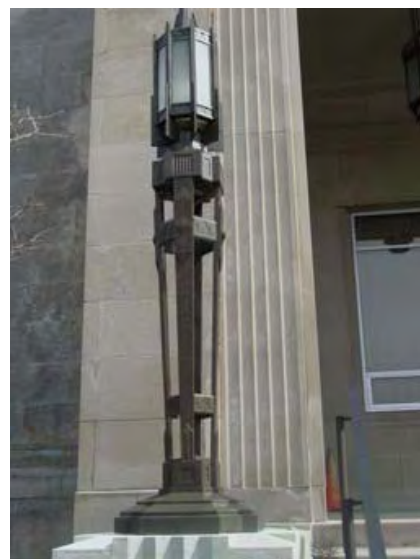
Photo 9: West Entrance Column



Photo 10: South Façade Limestone



Photo 11: Southwest Corner



**Photo 12: Exterior Entry Light
Fixture**

Facility 20012 Photos



Photo 13: Entry Portico Ceiling and Lights

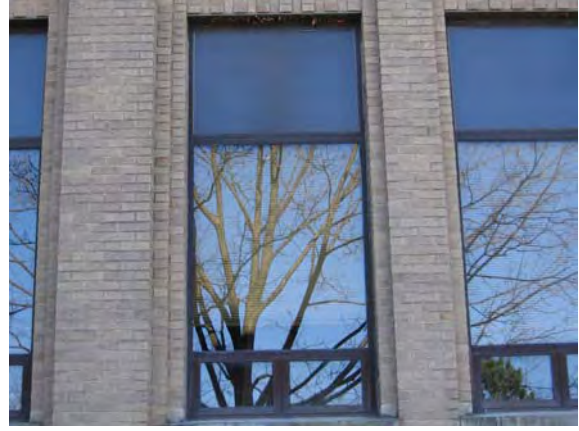


Photo 14: Existing Windows



Photo 15: Terrazzo Floor



Photo 16: Rotunda with Aluminum Lights & Doors



Photo 17: Aluminum Door



Photo 18: Aluminum Wall Light

Facility 20012 Photos



Photo 19: Glass Skylight



Photo 20: Rotunda Level 2

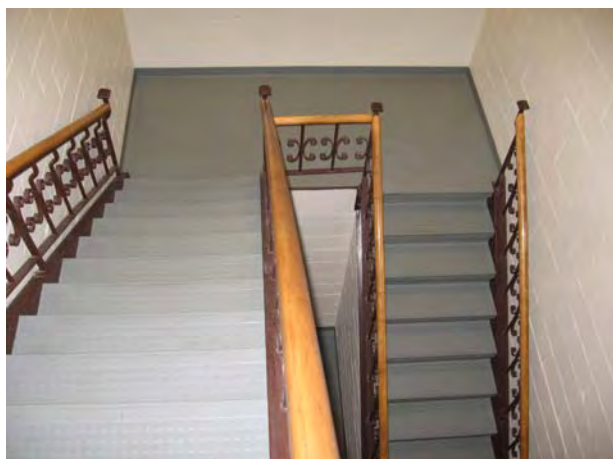


Photo 21: Interior Stairs to be Removed



Photo 22: Original Millwork



Photo 23: Existing Office Level 1

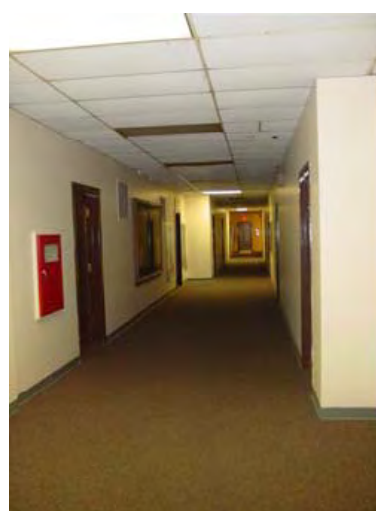


Photo 24: Hallway Level 2

Facility 20017 Photos



Photo 1: North Façade



Photo 2: West Façade with Deteriorating Roof

Facility 20017 Photos



Photo 3: South Façade



Photo 4: East Façade

Facility 20017 Photos



Photo 5: Typical Interior Office Space Level 1



Photo 6: Typical Restroom to be Replaced

Facility 20620 Addition



Photo 1: Looking south at north elevation of 20620



Photo 2: Looking west at east elevation of 20620

Facility 20620 Addition



Photo 3: Proposed area northeast of 20620, looking north



Photo 4: Proposed area north of 20620

Facility 20838 Vivarium Addition



Photo 1: Proposed site looking west at southeast elevation of 20838



Photo 2: Looking north across site

Facility 20838 Vivarium Addition



Photo 3: Looking east across site

Facility 20229 Religious Education Center Addition



Photo 1: Looking east across site, west elevation of 20229



Photo 2: Looking south across site

Facility 20229 Religious Education Center Addition



Photo 3: Looking north across site



Photo 4: Looking west across site

Facility 20229 Religious Education Center Addition



Photo 5: Looking east across site, south elevation of 20229

Proposed Entomology Facility Site



Photo 1: Looking south across site



Photo 2: Looking west across site

Proposed Entomology Facility Site



Photo 3: Looking north across site



Photo 4: Looking east across site

Waste Storage Facility Proposed Site



Photo 1: Looking south across site towards existing RCRA waste storage facility



Photo 2: Looking north across site towards Wright Field Historic District

Waste Storage Facility Proposed Site



Photo 3: Looking west across site



Photo 4: Looking east across site

Proposed USAFSAM Pipeline Student Dorm Site



Photo 1: Looking northwest across site towards Dorm 31218



Photo 2: Looking north across site towards Dorm 31218

Proposed USAFSAM Pipeline Student Dorm Site



Photo 3: Looking northeast across site

**USAFSAM Field Training Site
Alternative 1: Prime BEEF Training Area**



Photo 1: Site for regular and long tents, looking west



Photo 2: Site for latrine and EMEDS tents, looking west

USAFSAM Field Training Site, Alternative 2



Photo 1: Looking north across site



Photo 2: Looking northwest across site towards HPFF

Field site structure requirements (USAFSAM) for the Prime Beef Site – at Wright Patterson

| Mission | No of tents left up indefinitely | No of tents set up / taken down | Permanent structures i.e. ISO shelter, concrete pad, warehouse, etc. |
|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Aircraft Mishap Investigation | | | Aircraft hulks - T-38 & - C-30 fuselage cross-section - shed for storage |
| Contingency/Counter Terrorism Casualty Decontamination | | | - forklift shared with EMEDS - shed/building for storage |
| Contingency Preventive Medicine Field site | Uses EMEDS Alaska shelter | | - forklift shared with EMEDS |
| BEE Officer/Enlisted field site and Hazardous Waste Ops & Emergency Response | | | ISO – can use MNBC if co-located |
| NBC Operations | Alaska shelter - 4 | | 1 ISO shelter 4 Storage shelters - forklift shared with EMEDS Gator, 4-wheeler, PU Truck, etc. |
| EMEDS | Standard Alaska shelter: 15x36ft: -7 remain erected at all times | Standard Alaska shelter: 15x36ft: -4 taken down at end of course | -ISO shelters: -3 double width -2 single width |
| EMEDS (cont.) | Extended AK shelter: 15x52ft: - 8 all remain erected. (-2 are classrooms, 2 are latrines, and 4 are sleeping tents.) | | -2-door CONEX: 16 total |
| EMEDS (cont.) | -CAMS tent: 50x150ft: remains erected for vehicular IED sim | | -4-door CONEX: 1 total |
| EMEDS (cont.) Additional items: - 5 ton vehicle static: 2 - Humvee ambulance mock-up - 1 | | | -Containers (storage similar to shipping truck containers): 9 (3 of which are 1/2 length) total |
| BEMRT: | Tents: 2 standard AK shelters erected at all times 1 tent for exercises | | 2 door CONEX: 3 total |

**USAFSAM Expeditionary Medical Support (EMEDS)
Field Training Site Equipment Pictures**



Alaska Shelter Tents



CONEX Boxes

**USAFSAM Expeditionary Medical Support (EMEDS)
Field Training Site Equipment Pictures**



Storage Containers



Aircraft Hulks



February 20, 2008

Raymond F. Baker
Cultural Resources Manager
Operations Branch
Environmental Management Division
88 ABW / CEVO
Building 89
5490 Pearson Road, Area C
Wright-Patterson Air Force Base, Ohio 45433-5332

Dear Mr. Baker:

Re: Base Realignment and Closure Facility Renovation and New Facility Construction

This is in response to correspondence received on December 5, 2007. Our comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and the associated regulations at 36 CFR Part 800.

Your correspondence dated November 30, 2007 outlines nine projects to be undertaken at Wright-Patterson Air Force Base (WPAFB) to accommodate incoming Base Realignment and Closure (BRAC) missions:

- A. Facility 20012 Interior / Exterior Renovation (Site 1)
- B. Facility 20017 Interior / Exterior Renovation (Site 2)
- C. Facility 20620 Addition / Alteration (Site 3)
- D. Facility 20838 Vivarium Addition (Site 4)
- E. Facility 20229 Religious Education Center Addition (Site 5)
- F. Construction of an Entomology Facility on the former site of Facility 20095 (Site 6)
- G. Construction of a Waste Storage Facility to be co-located with Facility 20479 (Site 7)
- H. Construction of USAF School of Aerospace Medicine Pipeline Student Dorm (Site 8)
- I. Construction of USAF School of Aerospace Medicine Field Training Site
 - Alternative 1 – Prime BEEF Training Area (Site 9)
 - Alternative 2 – Adjacent to Huffman Prairie Flying Field (Site 10)

The Air Force seeks our concurrence that the proposed projects will have no adverse effect on historic properties.

Raymond F. Baker
February 20, 2008
Page Two

My staff has reviewed the project descriptions, mapping, photographs, and additional information provided in your correspondence. Given their locations and scopes of work, it is our opinion that Projects D, E, G, and H (at Sites 4, 5, 7, and 8) will not affect properties that are listed in or eligible for listing in the National Register of Historic Places (NRHP). No further coordination with this office is necessary regarding these projects.

Projects A, B, C, and F will affect historic properties. Project A (at Site 1) will result in physical changes to Facility 20012. This building is a contributing resource in the Wright Field Historic District, which has been determined to be eligible for listing in the NRHP, and is also individually eligible for listing in the NRHP for its architectural significance. Project B (at Site 2) will result in physical changes to Facility 20017, another contributing resource in the Wright Field Historic District. Project C will result in physical changes to facility 20620, a property that has been determined to be individually eligible for listing in the NRHP under Criterion A and Criterion Consideration G. Project F will involve new construction within the Wright Field Historic District.

Project I, the construction of a USAF School of Aerospace Medicine Field Training Site, has the potential to affect historic properties at either proposed location. The preferred site (Site 9), the Prime BEEF Training Area, contains an archaeological site, 33 GR 924, that may be eligible for listing in the National Register of Historic Places. The alternative site (Site 10) is adjacent to Huffman Prairie Flying Field, a National Historic Landmark.

We appreciate the Air Force's efforts to facilitate early coordination with our office regarding these time-sensitive projects. Additional information about several of the proposed projects is needed to properly assess their effects on historic properties. So that the Air Force may begin construction activities on those projects that will not affect historic properties (Projects D, E, G, and H), we concur with the agency's findings that the BRAC activities outlined in your correspondence dated November 30, 2007 will have no adverse effect on historic properties provided that the following conditions are met:

- Plans for the rehabilitation of Facility 20012 (Project A) and Facility 20017 (Project B) are submitted to the Ohio Historic Preservation Office for review and approval prior to the start of construction at these properties.
- Plans and specification for the rehabilitation and enlargement of Facility 20620 (Project C) are submitted to the Ohio Historic Preservation Office for review and approval prior to the start of construction at this property.
- Elevation drawings of the proposed Entomology Facility (Project F) are submitted to the Ohio Historic Preservation Office for review and approval prior to the start of construction at Site 6.
- If the preferred site (Site 9) is selected for Project I, WPAFB must complete additional Phase II testing of 33 GR 924 to determine its eligibility for the NRHP and consult with the Ohio Historic Preservation Office regarding appropriate avoidance measures prior to initiating construction activities.

Raymond F. Baker
February 20, 2008
Page Three

- If the alternative site (Site 10) is selected for Project I, WPAFB must provide a site plan showing the location of the proposed new facilities and elevation drawings of each building to the Ohio Historic Preservation Office to facilitate consultation regarding the effects of this project on Huffman Prairie Flying Field. Digital photographs showing views from Huffman Prairie Flying Field with the proposed new facilities superimposed on them should also be provided.

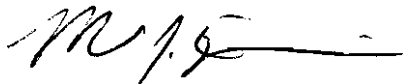
We offer the following comments regarding the proposed rehabilitation of Facility 20012 to assist the Air Force in developing treatment recommendations that meet the Secretary of the Interior's Standards for Rehabilitation.

Photo 21 included in Attachment 4 of your submission dated November 30, 2007 shows an interior staircase proposed for removal. The staircase includes a balustrade with decorative scrolled metal spindles and wood railing. The design of this stairway is consistent with Art Deco details throughout the building and, we believe, constitutes a character-defining feature of the property. Every effort should be made to retain this staircase and incorporate it into the proposed redesign.

Photo 1 included in Attachment 4 of your submission dated November 30, 2007 shows the east façade of Facility 20012, including a bronze pediment that forms the building's gabled roofline. The Air Force previously sought guidance from this office in its efforts to develop appropriate treatment recommendations for this feature. It remains our opinion that unless documentation – either physical or photographic – can be found that suggests that the feature was not painted historically, it should be left painted following completion of this project. Please see the enclosed email correspondence for a more detailed discussion of this issue.

If you have any questions, please contact Justin Cook, History Reviews Manager, by phone at (614) 298-2000 or by email at jcook@ohiohistory.org. Thank you for your cooperation.

Sincerely,



Mark J. Epstein, Department Head
Resource Protection and Review

MJE:jc

Enclosure: January 22, 2008 email correspondence

OHPO Ser. # 1016724

Justin Cook

From: Justin Cook
Sent: Tuesday, January 22, 2008 3:07 PM
To: 'Baker, Raymond F CIV USAF 88 ABW/CEVO'
Subject: RE: 20012 copper fascia

Raymond,

When developing treatment recommendations for a historic building, it is critical to research the history of the property. What do you know about the history of this feature on Building 12? Do historic photographs seem to indicate that the copper pediment shown below has been painted throughout the building's history?

All rehabilitation scopes of work should be based primarily on historic documentation -- whether it be physical documentation, photographic documentation, or, as a last resort, personal recollections/oral histories. If available documentation suggests that the pediment was painted historically, I would recommend leaving it so now.

Lacking documentation that clearly shows that the feature was NOT painted historically, the safer course of action in terms of guaranteeing conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties is to retain the existing conditions. The proposal to strip the paint and "return" the pediment to what someone believes may have been its original condition is tantamount to speculative restoration (as opposed to rehabilitation). Restoration requires a high level of historic documentation. As I understand it, WPAFB has yet to turn up anything that documents that the pediment was not painted historically. So right now you have no documentation to support the proposal to strip the existing paint and leave the copper exposed.

As we discussed on the phone earlier today, I am also slightly concerned that if documentation suggests that the copper was painted historically, the substrate may never have been intended to be exposed. We see this fairly frequently with brick buildings. Exposing historic brick construction has become very popular recently, and some folks seem to have difficulty believing that a brick building may have been painted at the time of its construction. Often times paint was applied as a protective layer to cover poor quality brick. In such instances, if the process of removing the paint doesn't damage the brick, leaving inferior quality brick exposed to the elements may just do the trick. While it is unlikely that the metal substrate on Building 12 would have similar issues due to the fact that, compared to mid-19th century brick making, there are far fewer variables in the creation of copper building components, it is still something to keep in mind.

Finally, any treatment that involves the use of chemicals to give a building material a different appearance than it actually has (in this instance, the proposal is to make the copper look "aged" after removing the paint) likely does not meet the Standards. Such a treatment would seem to conflict with Standard 3 in that it would be creating a false historic appearance.

Justin Cook
History Reviews Manager
Resource Protection and Review
Ohio Historic Preservation Office
567 East Hudson Street
Columbus, Ohio 43211-1030
Email: jcook@ohiohistory.org
Phone: (614) 298-2000
Fax: (614) 298-2037

-----Original Message-----

From: Baker, Raymond F CIV USAF 88 ABW/CEVO [mailto:Raymond.Baker@wpafb.af.mil]
Sent: Tuesday, January 22, 2008 11:20 AM
To: Justin Cook

Subject: RE: 20012 copper fascia



Here is a picture, the copper is the brown painted area above the brick.

From: Baker, Raymond F CIV USAF 88 ABW/CEVO
Sent: Tuesday, January 22, 2008 11:18 AM
To: 'Justin Cook'
Subject: 20012 copper fascia

Justin,

Per our telephone conversation this morning regarding building 12 and the painted copper fascia on the east side of the building, I am requesting your written opinion regarding stripping the paint off the copper. One of our architect's is proposing to have the paint stripped off of the copper and then chemically treat the copper to make it look "aged". We are investigating through historical photographs whether or not the copper was originally painted. This was not included in my 30 Nov 07 BRAC coordination letter to you.

Thanks
Raymond

Baker, Raymond F CIV USAF 88 ABW/CEVO

From: Nathan Young [nyoung@ohiohistory.org]
Sent: Friday, February 29, 2008 12:03 PM
To: Baker, Raymond F CIV USAF 88 ABW/CEVO
Subject: RE: BRAC Facility Site 9, Prime BEEF Training Area

Hello Raymond,
Based on this mapping, I concur that this undertaking will have no adverse effect on 33 GR 924 and that we can drop that specific condition. I will put all of this info with the original submission.
Thanks.

-----Original Message-----

From: Baker, Raymond F CIV USAF 88 ABW/CEVO [mailto:Raymond.Baker@wpafb.af.mil]
Sent: Friday, February 29, 2008 11:59 AM
To: Nathan Young
Cc: Justin Cook; Ferguson, Jan E CIV USAF 88 ABW/CEVO
Subject: BRAC Facility Site 9, Prime BEEF Training Area

Nate,

I just spoke with Justin regarding the proposed installation of a sanitary waste line to a manhole that is on the boundary of archaeological site 33 GR 924 located in the Prime BEEF Training Area of the base. We have determined that the sanitary waste line does not have to be connected to the existing sanitary main at this manhole, but can be connected to the main 20 feet to the east of the manhole which will completely avoid site 33 GR 924 (see attached site map).

Therefore, since the installation of the sanitary waste line will avoid the site, we are requesting OHPO's concurrence of no adverse effect on this site and that the condition stated in OHPO's 20 Feb 08 letter to complete Phase II testing of site 33 GR 924 to determine NRHP eligibility prior to initiating construction activities is no longer a required condition.

Please let me know if you have any questions or concerns.

<<PBTA Sanitary Line Feb 08.pdf>>

Thank you,
Raymond

Raymond F. Baker, CHMM
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Environmental Management Division
88 ABW/CEVO
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Appendix G
Air Emissions Calculations

Appendix G **BRAC Facilities and Remote Field Training Site** **Emissions Estimate**

Construction Emissions

| Area Description | Area | | Project Duration | Emission Factor | Control Efficiency | Estimated Emissions |
|----------------------------|---------------------|--------|------------------|-------------------|--------------------|----------------------------------------------|
| †1 Fiscal Year 2008 | A | | T | EM _{FAC} | CE | E _{TON} |
| | A = L * W | | | †2 | †3 | E _{TON} = A * T * EM _{FAC} |
| | (ft. ²) | (acre) | (months) | (ton/acre/month) | (%) | (ton) |
| Remote Field Training Site | 174,240.0 | 4.0 | 12.00 | 1.2 | 80% | 2.3 |
| Vivarium | 13,068.0 | 0.3 | 12.00 | 1.2 | 80% | 0.17 |
| Entomology Site | 26,136.0 | 0.6 | 12.00 | 1.2 | 80% | 0.35 |
| Waste Storage Facility | 21,780.0 | 0.5 | 12.00 | 1.2 | 80% | 0.29 |
| CONSTRUCTION IMPACT | 235,224.0 | 5.4 | | | | 3.11 |

| Normal Base-wide Emissions | Variable Description |
|----------------------------|----------------------|
| E _{NORM} | Symbol |
| †4 | Footnote |
| (ton/yr.) | Units |
| 19.68 | Values |

Fiscal Year 2009

| | | | | | | |
|-----------------------------------------|-----------|------|-------|-----|-----|------|
| Add/Alter F/20620 (Sensors Directorate) | 217,800.0 | 5.0 | 12.00 | 1.2 | 80% | 2.88 |
| Pipeline Dormitory | 217,800.0 | 5.0 | 12.00 | 1.2 | 80% | 2.88 |
| Religious Center Expansion | 54,450.0 | 1.3 | 12.00 | 1.2 | 80% | 0.72 |
| CONSTRUCTION IMPACT | 490,050.0 | 11.3 | | | | 6.48 |

Conclusions:

Projects in FY09 likely to exceed de minimis 5 TPY particulate threshold.

LEGEND

†1 Note: Assumes 20% of project area is exposed for a period of 12 months.

†2 Note: Emission factor Section 13.2.3 "Heavy Construction Operations" (dated 1/95), of AP-42, "Compilation of Air Pollutant Emission Factors", 5th Edition, U.S. EPA, Research Triangle Park, NC, 1998.

†3 Note: Table 2.1.1-3 - "Summary of Techniques, Efficiencies, and Costs for Controlling Fugitive Dust from Paved and Unpaved Surfaces, Fugitive Dust Control Technology, Orlemann (1993). Control efficiency for watering of paved surfaces.

†4 Note: Particulate emissions from WPAFB Fee Emission Report for 2005.